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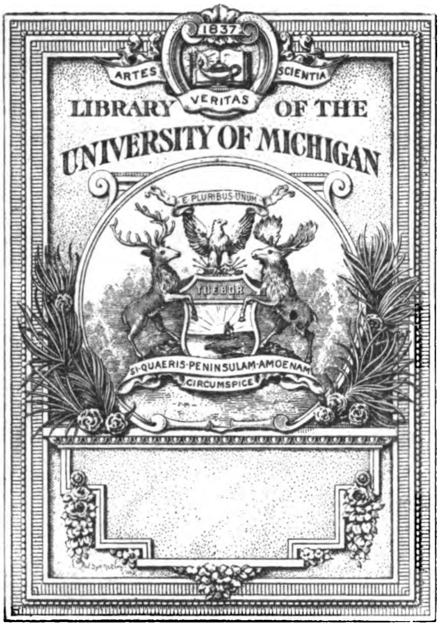

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U.S. INTERSTATE COMMERCE COMMISSION
WASHINGTON, D. C.

REGULATIONS FOR THE

TRANSPORTATION OF EXPLOSIVES AND OTHER DANGEROUS ARTICLES BY FREIGHT AND BY EXPRESS

AND

SPECIFICATIONS FOR SHIPPING CONTAINERS

PRESCRIBED UNDER THE ACT OF MARCH 4, 1909, AND SECTION 15 OF THE ACT TO REGULATE COMMERCE, AS AMENDED JUNE 18, 1910 :: :: ::

EFFECTIVE MARCH 31, 1912, EXCEPT AS NOTED HEREIN

Paragraphs are numbered to correspond to the rules and regulations of the American Railway Association

WASHINGTON
1911

THE INTERSTATE COMMERCE COMMISSION.

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REGULATIONS FOR THE TRANSPORTATION OF EXPLOSIVES BY FREIGHT.

REGULATIONS FOR THE TRANSPORTATION OF EXPLOSIVES BY FREIGHT.

Prescribed under act of Mar. 4, 1909. Originally formulated and published Jan. 15, 1910. Effective 90 days thereafter. Revision formulated and published Jan. 1, 1912. Effective 90 days thereafter, and superseding on Mar. 31, 1912, the regulations formulated and published Jan. 15, 1910.

GENERAL NOTICE.

As the use of certain explosives is essential to various business activities throughout the country it is the duty of interstate railroad carriers that transport such explosives to do so under proper regulations. It is also the duty of each such carrier to make the prescribed regulations effective and to thoroughly instruct its employees in relation thereto, and of shippers to properly acquaint themselves therewith.

The Commission will make further provision as occasion may require for new explosives not included in or covered by the following regulations.

GENERAL RULES.

A. Unless specifically authorized by these regulations, explosives must not be packed in the same outside package with each other or with other articles. Explosives, when offered for shipment by rail, must be in proper condition for transportation and must be packed, marked, loaded, stayed and handled while in transit in accordance with these regulations. All packages of less than carload shipments must also be plainly marked on the outer covering or boxing (outside package) with the name and address of consignee. Empty boxes previously used for high explosives are dangerous and must not be again used for shipments of any character. Empty boxes which have been used for the shipment of other explosives than high explosives must have the old marks thoroughly removed before being used for the shipment of other articles. Empty metal kegs which have been used for the shipment of black powder which was not contained in an interior package must not be again used for shipment of any explosive.

To enable the carrier to provide proper cars at stations where less than carload shipments of the dangerous explosives named in paragraph 1661 are offered for loading by the carrier, the shipper must give to the carrier not less than 24 hours' notice of his intention to offer such shipments and state their destinations.

B. Explosives, except such as are forbidden (see pars. 1501 and 1531 to 1536), may be received for transportation by railroads engaged in interstate commerce, provided the following regulations are complied with, and provided their method of manufacture and packing, so far as it affects safe transportation, is open to inspection by a duly authorized representative of the initial carrier or of the Bureau for the Safe Transportation of Explosives and Other Dangerous Articles, of the American Railway Association, hereinafter called Bureau of Explosives. Shipments of explosives that do not comply with these regulations must not be received. Shipments offered by the United States Government may be packed, including limitations of weight, as required by its regulations.

C. Before any shipment of explosives destined to a point beyond the lines of the initial carrier is accepted from the shipper, the initial carrier must ascertain that the shipment can go forward via the route designated, and that delivery can be made at destination. To avoid unnecessary delays, arrangements must be made to furnish this information promptly to initial carrier. Shipments offered by connecting lines must be subject to these regulations.

D. Consignees must remove shipments of explosives from the carriers' property within 48 hours after notice of arrival at destination. (See par. 1672.)

TESTS FOR STRENGTH OF PACKAGE.

E. When inexplosive material of equal weight is substituted (fine and dry sand for a granular explosive, dummy cartridges for high-explosive cartridges), and the outside package is dropped two times successively on its end to solid brick or concrete from a height of *four* feet, the outside package must not open nor rupture, nor must any portion of the contents escape therefrom.

F. In addition to standing the test in general rule E, the design and construction of packages must be such as to prevent the occurrence in individual packages of defects that permit leakage of their contents under the ordinary conditions incident to transportation and must be constructed in accordance with any specifications applicable and approved by the Interstate Commerce Commission. The results of experience, gained by an examination of packages on arrival at destination, must be recorded by the Bureau of Explosives, to the end that further use of any particular kind of package shown by experience to be inefficient may be prohibited by the Commission, even if it should stand the drop test prescribed by general rule E.

G. Violations of these regulations and accidents or explosions occurring in connection with the transportation or storage on railway property of explosives must be reported by the carrier to the chief inspector, Bureau of Explosives, 30 Vesey Street, New York City.

Serious violations discovered in cars containing explosives (such as defective packing, improper staying, rough treatment of car, broken packages, etc.), with a statement of apparent cause must be thus reported without delay. Clerical and routine errors should be noted and reported periodically.

All violations must be corrected before forwarding the car.

GROUPING.

H. For transportation purposes, explosives are divided into the following groups:

1. Forbidden explosives.
2. Black powder.
3. High explosives.
4. Smokeless powders.
5. Fulminates.
6. Ammunition.
7. Fireworks.

SECTION 1.

INFORMATION AND DEFINITIONS.

Group 1.—Forbidden Explosives.

See paragraphs 1531 to 1536.

1501. The following are forbidden explosives:

(*a*) **Liquid nitroglycerin.**

(*b*) **Dynamite** containing over 60 per cent of nitroglycerin (except gelatin dynamite).

(*c*) **Dynamite** having an unsatisfactory absorbent, or one that permits leakage of nitroglycerin under any conditions liable to exist during transportation or storage.

(*d*) **Nitrocellulose** in a dry condition, in quantity greater than ten (10) pounds in one exterior package. (See pars. 1555 to 1559.)

(*e*) **Fulminate of mercury in bulk** in a dry condition, and fulminates of all other metals in any condition, except as a component of manufactured articles whose transportation is not forbidden herein.

(*f*) **Fireworks** that combine an explosive and a detonator or blasting cap. (See pars. 1515 and 1644.)

(*g*) **Fireworks** that ignite spontaneously when subjected for 48 consecutive hours in the presence of moisture to the temperature of boiling water.

(*h*) **Firecrackers** whose dimensions exceed 5 inches in length or three-quarters of an inch in diameter or whose explosive charges exceed 45 grains each in weight.

(*i*) **Toy torpedoes or caps** exceeding 1½ inches in diameter, or containing more than an average of thirty-five hundredths of a grain of explosive composition per cap.

(*j*) **Fireworks** [1] that can be exploded en masse by a commercial detonator placed in one of the units or by the impact of a rifle bullet or otherwise.

(*k*) **Fireworks** containing a match tip or head, or similar igniting point or surface, unless each individual tip, head, or similar igniting point or surface is entirely covered and securely protected from accidental contact or friction with any other surface.

Group 2.—Black Powder.

See paragraphs 1541 to 1545.

1502. Black powder embraces all explosives having a composition similar to that of ordinary gunpowder, such as carbonaceous material, sulphur, and a nitrate of sodium or potassium. This group includes rifle, sporting, blasting, cannon, and the prismatic powders.

Group 3.—High Explosives.

See paragraphs 1551 to 1560.

1503. High explosives are all explosives more powerful than ordinary black powder, except smokeless powders and fulminates. Their distinguishing characteristic is their susceptibility to detonation by a commercial detonator, or blasting cap. Many high explosives are sensitive to percussion and to friction. Examples of high explosives are the dynamites, picric acid, picrates, chlorate powders, and nitrate of ammonia powders.

Group 4.—Smokeless Powders.

See paragraphs 1571 to 1579.

1504. Smokeless powders are those explosives from which there is little or no smoke when fired. The group consists of smokeless powder for cannon and smokeless powder for small arms. Smokeless powder for cannon used in the United States at the present time consists of a nitrocellulose colloid, and is safe to handle and transport. Smokeless powders for small arms may consist of nitrocellulose, nitrocellulose combined with nitroglycerin, picrate mixtures, or chlorate mixtures.

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[1] Such articles may be shipped when packed, marked, and certified in accordance with these regulations and offered for shipment as high explosives.

Group 5.—Fulminates.

See paragraphs 1591 to 1593.

1505. This includes **fulminate of mercury** in bulk form—that is, not made up into percussion caps, detonators, blasting caps, or exploders.

Group 6.—Ammunition.

See paragraphs 1601 to 1622.

1506. **Small-arms ammunition** (such as is used in sporting or fowling pieces, or in rifle, pistol practice, etc.), consists usually of a paper or metallic shell, the primer, and the powder charge, with or without shot or bullet, the materials necessary for one firing being all in one piece.

1507. **Ammunition for cannon** embraces all fixed or separate-loading ammunition packed in a single package in which the projectile weighs 1 pound or over, and is usually transported only for Government use. When the component parts are packed in separate outside packages such packages will be shipped as smokeless powder for cannon, explosive projectiles, empty (including solid) projectiles, primers, or fuses. Igniters composed of black powder may be attached to packages in shipments of smokeless powder.

1508. **Explosive projectiles,** or loaded shells for use in cannon, are not liable to be exploded except by fire of considerable intensity, and the flying fragments would then be very dangerous.

1509. **Detonators** is the technical name for articles such as blasting caps, the use of which is to cause explosions of a high order, or "detonations." This means the instantaneous conversion of the entire explosive into gas instead of the gradual conversion known as "combustion." Dynamite "detonates" and smokeless powder for cannon "burns."

1510. **Blasting caps** contain from 5 to 50 grains of dry fulminate of mercury, or a similar substance, packed in a thin copper cup and fired by a slow-burning safety fuse. When a small "bridge" of fine wire is embedded in the fulminate, held by a sulphur cast, and arranged to fire the fulminate by heating the bridge by means of an electric current, the cap is called an "electric blasting cap."

1511. **Detonating fuzes** are used to detonate the high explosive bursting charges of projectiles or torpedoes. In addition to a powerful detonator they may contain several ounces of a high explosive, such as picric acid or dry nitrocellulose, all assembled in a heavy steel envelope, the flying fragments of which, in case of explosion, would be very dangerous. From their careful design, manufacture and packing detonating fuzes are not liable to be exploded in transportation except by fire of considerable intensity.

1512. **Primers, percussion and time fuzes** are devices used to ignite the black powder bursting charges of projectiles, or the powder charges of ammunition. For small-arms ammunition the primers are usually called "small-arm primers" or "percussion caps." Percussion tracer fuzes consist of a device which is attached to a projectile and contains a slow-burning composition to show the flight of projectiles at night.

Group 7.—Fireworks.

See paragraphs 1641 to 1647.

1513. **Fireworks** include everything that is designed and manufactured primarily for the purpose of producing a visible or an audible pyrotechnic effect by combustion or by explosion. They consist of common fireworks and special fireworks. (See par. 1501 (*j*) and footnote.)

1514. **Common fireworks** include all that depend principally upon nitrates to support combustion and not upon chlorates; that contain no phosphorus and no high explosive sensitive to shock and friction; that produce their effect through color display rather than by loud noises. If noise is the principal object, the units must be small and of such nature and manufacture that they will explode separately and harmlessly, if at all, when one unit is ignited in a packing case. They must not be designed for ignition by shock or friction. Examples are Chinese firecrackers, Roman candles, pin wheels, colored fires, rockets, serpents, railway fusees, flash powders, etc.

1515. **Special fireworks** include all that contain any quantity of phosphorus, a fulminate, or other high explosive sensitive to shock or friction, or that contain units of such size that the explosion of one while being handled would produce a serious injury, or that require a special appliance or tool, mortar, holder, etc., for their safe use, or that are designed for ignition by shock or friction. Examples are giant firecrackers, bombs and salutes not high explosives, toy torpedoes and caps, ammunition pellets fired in a special holder, railway torpedoes, etc. (See par. 1501 (*j*) and footnote.)

SECTION 2.

CONDITIONS OF ACCEPTANCE AND SHIPMENT OF PACKAGES.

Group 1.—Forbidden and Condemned Explosives.

1531. Forbidden explosives, as defined in paragraph 1501, and explosives condemned by the Bureau of Explosives (except properly repacked samples for laboratory examination), must not be shipped. Samples of any new explosive must be examined and approved as safe for transportation by the Bureau of Explosives before shipments (except samples for this examination not exceeding 5 pounds net in weight) can be accepted. For this purpose a new explosive is defined to be the product of a new factory or an explosive of an essentially new composition made by an old factory.

1532. Leaking or damaged packages of explosives must not be shipped. Should any package of high explosives when offered for shipment show excessive dampness or be moldy or show outward signs of any oily stain or other indication that absorption of the liquid part of the explosive is not perfect or that the amount of the liquid part is greater than the absorbent can carry, the packages must be refused in every instance. The shipper must substantiate any claim that a stain is due to accidental contact with grease, oil, or similar substance. In case of doubt, the package must be rejected. A shipment of leaking dynamite is liable to cause a disaster in spite of careful handling; and storage, especially in warm and damp magazines, tends to cause leakage. Carriers must, for these reasons, examine with more than usual care all packages that have been stored or are offered for shipment during the summer months.

REPACKING OF DYNAMITE.

1533. Condemned dynamite must not be repacked and shipped unless the repacking is done by a competent person in the presence and with the consent of a local inspector, or with the written authority of the chief inspector, of the Bureau of Explosives.

DISPOSITION OF INJURED, CONDEMNED, AND ASTRAY PACKAGES.

1534. Packages found injured or broken in transit may be recoopered when this is evidently practicable and not dangerous. A broken box of dynamite that can not be recoopered should be reenforced by stout wrapping paper and twine, placed in another strong box, and surrounded by dry, fine sawdust, or dry and clean cotton waste, or elastic wads made from dry newspaper. A ruptured can or keg should be inclosed in a grain bag of good quality and boxed or crated. Injured packages thus protected and properly marked may be forwarded.

1535. Condemned packages of leaking dynamite should (1) be returned immediately to shipper if at point of shipment; or (2) disposed of to a dealer in dynamite or other person who is competent and willing to remove them from railway property, if leakage is discovered while in transit; or (3) removed immediately by consignee if shipment is at destination.

When disposition can not be made as above, the leaking boxes must be packed in other boxes large enough to permit, and the leaking box must be surrounded by at least 2 inches of dry, fine sawdust, or dry and clean cotton waste, and be stored in station magazine or other safe place until arrival of the local inspector or other authorized person to superintend the destruction of the condemned material.

1536. When name and address of consignee are known, an astray shipment must be forwarded to its destination by the most practicable route, provided a careful inspection shows the packages to be in proper condition for safe transportation. Revenue or other waybill must be prepared on which must be written or stamped "Astray shipment, inspected at ——— station, ——— railroad, ——— 19—." When a package in an astray shipment is not in proper condition for safe transportation (see par. 1534), or when name and address of consignee are unknown, disposition will be made as prescribed by paragraph 1535.

Group 2.—Black Powder.

1541. **Packing.**—Packages containing less than 12½ pounds of rifle, sporting, blasting, or cannon powders must be inclosed in a tight box with the filling holes of the packages up, and the boxes must be marked on top as prescribed by paragraph 1544.

1542. Twelve and a half pounds or over of black powder must be packed in packages that comply with general rules E and F. Kegs less than 9 inches long must be boxed as prescribed by paragraph 1541.

1543. **Weight.**—Packages must not weigh over 150 pounds gross.

1544. **Marking.**—Each outside package must be plainly marked, stamped, or stenciled to show the kind, "BLACK," and the use, "BLASTING," "RIFLE," "CANNON," "MORTAR," etc., as "BLACK BLASTING POWDER," "BLACK RIFLE POWDER," etc. Additional marks, trade names, etc., may appear if desired by shipper.

1545. **Car.**—A car containing shipments of black powder in any quantity must be certified and placarded as prescribed by paragraphs 1661 and 1666.

Group 3.—High Explosives.

1551. High explosives consisting of a liquid mixed with an absorbent material must have the absorbent (wood pulp or similar material) in sufficient quantity and of satisfactory quality, properly dried at the time of mixing; nitrate of soda must be dried at the time of mixing to less than 1 per cent of moisture; and the ingredients must be uniformly mixed so that the liquid will remain thoroughly absorbed under the most unfavorable conditions incident to transportation.

1552. Explosives containing nitroglycerin must have uniformly mixed with the absorbent material a satisfactory antacid which must be in quantity sufficient to have the acid neutralizing power of an amount of magnesium carbonate equal to 1 per cent of the nitroglycerin.

1553. **Packing.**—High explosives containing more than 10 per cent of nitroglycerin must be made into cartridges not exceeding 4 inches in diameter or 8 inches in length (does not apply to gelatine dynamite) and must not be packed in bags or sacks. Bags or sacks of high explosives containing not more than 10 per cent of nitroglycerin and not over 12½ pounds each of explosive must be shipped as cartridges, but these bags must be strong and must be placed in a box with filling ends up. The covering of all cartridges consisting of paper or other material must be strong and so treated that it will not absorb the liquid constituent of the explosive.

1554. All boxes in which cartridges containing nitroglycerin are packed must be lined with a suitable material that is impervious to liquid nitroglycerin. Cardboard cartons closed at the bottom and made of strong and flexible material that is impervious to nitroglycerin form a satisfactory lining. At least one-quarter of an inch of dry sawdust or similar material must be spread over the bottom of the box before inserting the cartridges, and all the vacant space in the top must be filled with this material. The cartridges, except the bags or sacks authorized in paragraph 1553, must be so arranged in the boxes that when they are transported with the boxes top side up all cartridges will lie on their sides and never on their ends.

1555. Inside packages containing not more than 1 pound each of dry nitrocellulose, wrapped in strong paraffined paper or other suitable spark-proof material, will be accepted for shipment if securely packed in an outside package that complies with requirements of paragraph 1557, and is marked as prescribed in paragraph 1559. Outside packages must not contain more than 10 pounds of dry nitrocellulose.

1556. High explosives containing no explosive liquid ingredient and not having, with their normal percentage of moisture, a sensitiveness to percussion greater than measured by the blow delivered by an 8-pound weight dropping from a height of 5 inches on a compressed pellet of the explosive three-hundredths of an inch in thickness and two-tenths of an inch in diameter held rigidly between hard steel surfaces as in the standard impact-testing apparatus of the Bureau of Explosives, may be shipped when securely packed in bulk. Wooden boxes and kegs must be provided with suitable linings to prevent leakage. These explosives may also be packed in cartridges, and must be so packed when their sensitiveness is greater than the above limit. When the addition of not less than 20 per cent of water to any such explosive will make it nonexplosive according to tests made by the Bureau of Explosives the wet material may be shipped and handled in transit as prescribed by Regulations for the Transportation of Dangerous Articles other than Explosives by Freight.

1557. Boxes containing any high explosives and having a gross weight not exceeding 75 pounds must be made of sound lumber free from holes or loose knots, and when made with lock corners must be not less than one-half inch in thickness. When nailed boxes are used the ends must be not less than 1 inch thick. The limits for thickness refer to the finished box and not to the undressed lumber.

Packages containing any high explosive must also fulfill the requirements of general rules E and F.

1558. **Weights.**—High explosives containing an explosive liquid ingredient must not exceed 75 pounds gross weight in one outside package.

High explosives containing no liquid explosive ingredient as defined in paragraph 1556 must not exceed 125 pounds gross weight in one outside package.

The gross weight of an outside package containing dry nitrocellulose, packed as prescribed in paragraph 1555, must not exceed 35 pounds.

1559. **Marking.**—Boxes must be plainly marked on top and on one side or end and kegs must be marked on one end "HIGH EXPLOSIVE—DANGEROUS" in letters not less than seven-sixteenths inch in height. The tops of boxes must be marked "THIS SIDE UP."

1560. **Car.**—For shipments of high explosives in any quantity the car must be certified and placarded as prescribed by paragraphs 1661 and 1666.

Group 4.—Smokeless Powders.

SMOKELESS POWDER FOR CANNON.

1571. **Packing.**—Smokeless powder for cannon must be packed in tight boxes free from loose knots and cracks, in barrels or in kegs, that comply with general rules E and F. Smokeless powder for cannon may be packed in water in strong barrels of the type used for alcohol.

1572. **Weight.**—Packages must not weigh over 165 pounds gross unless packed in water.

1573. **Marking.**—Each package must be plainly marked on top "SMOKELESS POWDER FOR CANNON."

1574. **Car.**—Smokeless powder for cannon may be shipped in any box car in good condition. The car must be placarded "INFLAMMABLE" as prescribed by paragraph 1663.

SMOKELESS POWDER FOR SMALL ARMS.

1575. **Packing.**—Packages of less than 9 pounds of smokeless powder for small arms must be inclosed in a tight box so that the filling hole of each inside package will be up, and the box must be marked on top as prescribed by paragraph 1578.

1576. Quantities of 9 pounds or over must be placed in packages that comply with general rules E and F. Kegs less than 9 inches long must be boxed as prescribed by paragraph 1541.

1577. **Weight.**—Packages must not weigh over 150 pounds gross.

1578. **Marking.**—Each outside package must be plainly marked on top "SMOKELESS POWDER FOR SMALL ARMS."

1579. **Car.**—Shipments of smokeless powder for small arms in any quantity require a car to be certified and placarded as prescribed by paragraphs 1661 and 1666.

Group 5.—Fulminates.

1591. **Packing.**—Fulminate of mercury in bulk must contain when packed not less than 25 per cent of water, and must in this wet condition be placed in a bag made of heavy cotton cloth of close mesh equal in quality and weight to the cotton twill used for pockets in high-grade clothing. There must be placed inside the bag and over the fulminate a cap of the same cloth and of the diameter of the bag, and the bag must be tied securely and placed in a strong grain bag which must, in turn, be tied securely and packed in the center of a cask or barrel in good condition and of the kind used for shipment of alcohol. The grain bag must not contain more than 150 pounds dry weight of fulminate and it must be surrounded on all sides by tightly packed sawdust not less than 6 inches thick. The cask or barrel must be lined with a heavy close-fitting jute bag closed by secure sewing to prevent escape of sawdust. After the barrel is properly coopered it must be filled with water and the bung sealed. The barrel must be inspected carefully and all leaks stopped.

1592. **Marking.**—Each cask or barrel must be plainly marked "WET FULMINATE OF MERCURY—DANGEROUS."

1593. **Car.**—A car containing fulminate in any quantity must be certified and placarded as prescribed by paragraphs 1661 and 1666.

Group 6.—Ammunition.

SMALL-ARMS AMMUNITION.

1601. **Packing.**—Small-arms ammunition must be packed in pasteboard or other boxes and these boxes must be packed in strong outside boxes.

Small-arms ammunition in pasteboard or other boxes and in quantity not exceeding a gross weight of 75 pounds may be packed with nonexplosive and noninflammable articles and with small-arms primers or percussion caps (see par. 1619), provided the outside package is marked as prescribed in paragraph 1602.

1602. **Marking.**—Each outside package or case must be plainly marked "SMALL-ARMS AMMUNITION."

1603. **Car.**—No restrictions, other than proper packing and marking, are necessary for the shipment of small-arms ammunition.

AMMUNITION FOR CANNON.

1604. **Packing.**—Ammunition for cannon must be well packed and properly secured in strong boxes.

1605. **Marking.**—Each outside package must be plainly marked "AMMUNITION FOR CANNON WITH EXPLOSIVE PROJECTILES," or "AMMUNITION FOR CANNON WITH EMPTY PROJECTILES," or "AMMUNITION FOR CANNON WITH SAND-LOADED PROJECTILES," according as the projectiles do or do not contain a bursting charge, or "AMMUNITION FOR CANNON WITHOUT PROJECTILES."

1606. **Car.**—A car containing ammunition for cannon with explosive projectiles must be certified and placarded as prescribed by paragraphs 1661 and 1666. This is not required when explosive projectiles are not included, but in this case cars must be protected by "INFLAMMABLE" placard as prescribed by paragraph 1663.

EXPLOSIVE PROJECTILES.

1607. **Packing.**—Explosive projectiles must be packed in strong boxes and each projectile must be properly secured.

1608. **Weight.**—The gross weight of a box containing more than one projectile must not exceed 160 pounds.

1609. **Marking.**—Each exterior package must be plainly marked "EXPLOSIVE PROJECTILE," "SAND-LOADED PROJECTILE," or "EMPTY PROJECTILE." No restrictions, other than proper marking, are necessary for the shipment of sand-loaded projectiles or empty (including solid) projectiles.

1610. **Car.**—For explosive projectiles in any quantity the car must be certified and placarded as prescribed by paragraphs 1661 and 1666.

BLASTING CAPS.

1611. **Packing.**—Blasting caps contain such a sensitive and dangerous explosive that very efficient packing is necessary.

(*a*) Blasting caps must be packed in strong tin receptacles in which they must fit snugly and the caps must be closed securely by teats projecting from a plate of suitable elastic material placed inside the box and over the caps. Not more than 100 blasting caps may be packed in a single tin box. All separate tin boxes must then be packed snugly in cartons or wrappings made of paper or pasteboard.

(*b*) For not more than 1,000 caps the tin boxes in cartons or wrappings must be packed in an outside box made of sound lumber not less than three-eighths of an inch in thickness, and they must be separated from the outside box by at least 1 inch of tightly packed sawdust, excelsior or equivalent cushioning material.

(*c*) For not more than 5,000 caps the tin boxes in cartons or wrappings must be packed in an outside box made of sound lumber at least one-half inch thick; and they must be separated from the outside box by at least 1 inch of tightly packed sawdust, excelsior or equivalent cushioning material.

(*d*) For more than 5,000 caps the tin boxes in cartons or wrappings must be packed in an inside box made of sound lumber not less than three-eighths of an inch in thickness or in a hermetically sealed metal box made of not less than 30 gauge United States standard. This inside wooden or metal box must then be packed in an outside box made of sound lumber not less than 1 inch in thickness. Tightly packed sawdust, excelsior or equivalent cushioning material at least 1 inch thick at all points must separate the inside box from the outside wooden box.

(*e*) More than 20,000 blasting caps must not be placed in one outside package.

(*f*) Five tin boxes containing not more than 100 caps in each box may be packed with safety fuse, each box to be placed in the center of a coil of fuse and in this case the outside box may be made of sound lumber not less than three-eighths inch thick and must be marked as prescribed in paragraph 1648.

(*g*) Electric blasting caps must be packed in pasteboard cartons containing not more than 50 caps each. These cartons must be packed in a wooden box made of lumber not less than one-half inch in thickness.

1612. **Weight.**—The gross weight of an outside package containing blasting caps or electric blasting caps must not exceed 150 pounds.

1613. **Marking.**—Each outside package must be plainly marked "(number) BLASTING CAPS—HANDLE CAREFULLY," or "(number) ELECTRIC BLASTING CAPS—HANDLE CAREFULLY." In addition each box must bear the marking "DO NOT STORE OR LOAD WITH ANY HIGH EXPLOSIVE." (See also par. 1648 for marking when packed with safety fuse.)

1614. **Car.**—Certificate and placard as prescribed by paragraphs 1661 and 1666 are required for shipments of blasting caps in any quantity, except that not more than 500 blasting caps or 500 electric blasting caps may be transported in a box car in good condition without car certificate or placard.

DETONATING FUZES.

1615. **Packing.**—Detonating fuzes must be packed in strong, tight boxes and each fuze must be well secured.

1616. **Weight.**—The gross weight of one outside package must not exceed 150 pounds.

1617. **Marking.**—Each outside package must be plainly marked "DETONATING FUZES—HANDLE CAREFULLY."

1618. **Car.**—A car containing detonating fuzes in any quantity must be certified and placarded as prescribed by paragraphs 1661 and 1666.

PRIMERS, PERCUSSION AND TIME FUZES.

1619. **Packing.**—Primers, percussion and time fuzes must be packed in strong, tight boxes, with special provision for securing individual packages of primers and fuzes against movement in the box.

Small-arms primers containing anvils must be packed in cellular packages with partitions separating the layers and columns of primers so that the explosion of a portion of the primers in the completed shipping package will not cause the explosion of all of the primers.

Percussion caps may be packed in metal or other boxes containing not more than 500 caps, but the construction of the cap and the kind and quantity of explosives in each must be such that the explosion of a part of the caps in the completed shipping package will not cause the explosion of all of the caps.

Small-arms primers and percussion caps may form a part of the gross weight of 75 pounds of small-arms ammunition that may be packed with other articles as authorized by paragraph 1601.

1620. **Weight.**—The gross weight of one outside package must not exceed 150 pounds.

1621. **Marking.**—Each outside box must be plainly marked "SMALL-ARMS PRIMERS—HANDLE CAREFULLY," or "PERCUSSION CAPS—HANDLE CAREFULLY," or "CANNON PRIMERS—HANDLE CAREFULLY," or "COMBINATION PRIMERS—HANDLE CAREFULLY," or "PERCUSSION FUZES—HANDLE CAREFULLY," or "COMBINATION FUZES—HANDLE CAREFULLY," or "PERCUSSION TRACER FUZES—HANDLE CAREFULLY," etc.

1622. No restrictions other than proper packing and marking are necessary for the shipment of primers, percussion and time fuzes.

Group 7.—Fireworks.

COMMON FIREWORKS.

1641. **Packing.**—Common fireworks must be in a finished state, exclusive of mere ornamentation, as supplied to the retail trade, and must be securely packed in strong, tight, spark-proof wooden boxes or barrels that comply with general rules E and F.

1642. **Marking.**—Each outside package must be plainly marked "COMMON FIREWORKS—KEEP FIRE AWAY."

1643. **Car.**—Common fireworks may be shipped in a box car which is in good condition (see par. 1663), but they must not be loaded in the same car with explosives. (See par. 1680.)

A car containing any quantity of common fireworks must be protected by the "INFLAMMABLE" placard. (See par. 1663.)

SPECIAL FIREWORKS.

1644. **Packing.**—Special fireworks must be in a finished state, exclusive of mere ornamentation, as supplied to the retail trade, and must not contain forbidden fireworks. (See par. 1501 (*f*) to (*k*) inclusive.) All outside boxes or barrels must be spark-proof and must comply with general rules E and F.

Lock-corner boxes must be made of sound lumber tongued and grooved, and the thickness must not be less than three-eighths inch for a gross weight of 30 pounds or under; and for a gross weight exceeding 30 pounds and not exceeding 65 pounds the ends must not be less than nine-sixteenths inch, with sides, tops, and bottoms three-eighths inch thick. When the gross weight exceeds 65 pounds the ends must be battened.

If nailed boxes are used of the same thickness of lumber specified for lock-corner boxes, horizontal and vertical cleats not less than three-fourths of the thickness of the ends and not less than 1⅛ inches wide must be used on the ends; or in the absence of such cleats the tops, sides, and bottoms must be thicker by three-sixteenths inch and the ends thicker by one-fourth inch than specified for lock-corner boxes.

All boxes must be tongued and grooved.

1645. **Weight.**—The gross weight of one outside package containing special fireworks must not exceed 200 pounds, and the gross weight of a package containing toy torpedoes must not exceed 65 pounds.

1646. **Marking.**—Each outside package containing special fireworks or a mixture of common and special fireworks must be plainly marked "SPECIAL FIREWORKS—HANDLE CAREFULLY—KEEP FIRE AWAY."

1647. **Car.**—Special fireworks may be shipped in any box car which is in good condition (see par. 1663), but they must not be loaded in the same car with explosives. (See par. 1680.) A car containing any quantity of special or other fireworks must be protected by the "INFLAMMABLE" placard. (See par. 1663.)

SAFETY FUSE AND SAFETY SQUIBS.

1648. Safety fuse and safety squibs must be packed in strong wooden boxes or barrels properly marked, and may be loaded in any car with any other kind of an explosive or inflammable substance or with other freight.

When blasting caps are packed with safety fuse (see par. 1611 (*f*)) the outside package must be made of lumber not less than three-eighths inch thick and must be marked "(number) BLASTING CAPS PACKED WITH SAFETY FUSE," "DO NOT LOAD OR STORE WITH ANY HIGH EXPLOSIVE" as prescribed by paragraph 1613.

SECTION 3.

SELECTION AND PREPARATION OF CARS.

1661. The safe transportation of explosives depends very largely upon the kind and condition of the car in which they are loaded. For the transportation of carloads or less than carload lots of—

Black powder,
High explosives,
Smokeless powder for small arms,
Wet fulminate of mercury,
Blasting caps,
Electric blasting caps, } excepting a shipment of not more than 500 blasting caps or 500 electric blasting caps. (See par. 1614.)
Ammunition for cannon with explosive projectiles,
Explosive projectiles, or
Detonating fuzes,

only certified and placarded box cars may be used. (See pars. 1662, 1665, and 1666.)

1662. Certified cars must be inspected inside and outside and must conform to the following specifications:

(*a*) Not less than 60,000 pounds capacity. Steel underframe box cars or other box cars with friction draft gear should be used when available. On narow-gauge and other railroads, all of whose freight cars are of less than 60,000 pounds capacity, explosives may be transported in cars of less than that capacity, provided the available cars of greatest capacity and strength are used for this purpose.

(*b*) Must be equipped with air brakes and hand brakes in condition for service.

(*c*) Must have no loose boards or cracks in the roof, sides, or ends.

(*d*) The doors must shut so closely that no sparks can get in at the joints, and, when necessary, they must be stripped. The stripping for flush doors should be on the inside and be nailed to the door frame where it will form a shoulder against which the closed door is pressed. The openings under the doors should be similarly closed. When doors are not stripped the hasp fastenings must be examined with doors closed and fastened and must be cleated when necessary to prevent door shifting.

(*e*) The journal boxes and trucks must be carefully examined and put in such condition as to reduce to a minimum the danger of hot boxes or other failure necessitating the setting off of the car before reaching destination. The lids or covers of journal boxes must be in place.

(*f*) The car must be carefully swept out before it is loaded. Holes in the floor or lining must be repaired and special care taken to have no projecting nails or bolts or exposed pieces of metal which may work loose or produce holes in packages of explosives during transit.

(*g*) When the car is to be fully loaded with explosives or when explosives are loaded over exposed draft bolts or kingbolts, these bolts must have short pieces of solid, sound wood (2-inch plank) spiked to the floor over them to prevent possibility of their wearing into the packages of explosives.

(*h*) The roof of the car must be carefully inspected from the outside for decayed spots, especially under or near the running board, and such spots must be covered to prevent their holding fire from sparks. A car with a roof generally decayed, even if tight, must not be used.

(*i*) When explosives are to be carried in a "way car"[1] one should be selected with flush doors in good condition or with doors fitting so tightly that stripping will not be necessary.

(*k*) The carrier must have car examined to see that it is properly prepared, and must have a "Car certificate" signed in triplicate upon the prescribed form (see par. 1665) before permitting the car to be loaded.

(*l*) Cars not in proper condition, as above specified, must not be furnished to the shipper or used for the transportation of explosives.

1663. (*a*) Carloads or less than carload lots of—

Ammunition for cannon with empty projectiles,
Ammunition for cannon with sand-loaded projectiles,
Ammunition for cannon without projectiles,
Smokeless powder for cannon, or
Fireworks

may be loaded in any box car which is in good condition into which sparks can not enter and whose roof is not in danger of taking fire through unprotected decayed wood. These cars do not require the car certificate but must have attached to both sides and both ends the "INFLAMMABLE" placard prescribed by paragraph 1698, and the doors must be stripped when necessary.

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[1] A "way car" is one from which shipments are unloaded by the train crew.

(*b*) Carloads or less than carload lots of—
Small-arms ammunition,
Primers,
Percussion fuzes,
Time or combination fuzes,
Safety fuse and safety squibs
may be loaded in any box car which is in good condition, without car certificate or placards.

Placarding of Cars and Certification of Contents.

1664. Uniform practice is important and the prescribed forms of car certificates and placards must be used.

1665. **Car certificate.**—The following certificate (prescribed by par. 1662 (*k*)), printed on strong tagboard measuring 7 by 7 inches, must be duly executed in triplicate by the carrier, and by the shipper if he loads the shipment. The original must be filed by the carrier at the forwarding station on a separate file, and the other two must be attached to the outside of the car doors, one on each side, the lower edge of the certificate 4½ feet above the floor level.

CAR CERTIFICATES.

No. 1. ——— Station, ———, 19—.

I hereby certify that I have this day personally examined ——— car No. ———, and that the roof and sides have no loose boards, holes or cracks, or unprotected decayed spots liable to hold sparks and start a fire; that the kingbolts or draft bolts are properly protected and that there are no uncovered irons or nails projecting from the floor or sides of the car which might injure packages of explosives; also that the floor is in good condition and has this day been cleanly swept before the car was loaded; that I have examined all the axle boxes and that they are properly covered, packed, and oiled, and that the air brakes and hand brakes are in condition for service.

——— ———.

No. 2. ——— Station, ———, 19—.

I hereby certify that I have this day personally examined the above car; that the floor is in good condition and has been cleanly swept and that the roof and sides have no loose boards, holes, cracks, or unprotected decayed spots liable to hold sparks and start a fire; that the kingbolts and draft bolts are protected, and that there are no uncovered irons or nails projecting from the floor or sides of the car which might injure packages of explosives; that the explosives in this car have been loaded and stayed and that the car has been placarded according to paragraphs 1661, 1666, and 1674 to 1683, inclusive, of the Regulations for the Transportation of Explosives prescribed by the Interstate Commerce Commission; that the doors fit or have been stripped so that sparks can not get in at the joints or bottom.

——— ———,

——— ———.

NOTE.—Both certificates must be signed. Certificate No. 1 by the representative of the carrier. For all shipments loaded by the shipper he or his authorized agent must sign certificate No. 2, and the representative of the carrier must certify as to loading and staying and general condition. When the car is not loaded by shipper, certificate No. 2 must be signed only by the representative of the carrier. A shipper should decline to use a car not in proper condition.

1666. **Placard.**—Each car containing any of the explosives specified in paragraph 1661, in any quantities excepting a shipment of not more than 500 blasting caps or 500 electric blasting caps (see par. 1614), must be protected by attaching to the outside of the car on both sides and ends, the lower edge 4½ feet above the car floor, a standard placard 12 by 14 inches on which appears in conspicuous red and black printing on strong tag board the following notice:

.... R.......... COMPANY

EXPLOSIVES

(To be printed in red.)

HANDLE CAREFULLY

KEEP FIRE AWAY

(To be printed in red.)

.... Station ...., 19....

CONDENSED RULES FOR HANDLING THIS CAR.

1. This car must not be placed in a passenger train, nor in a mixed train if avoidable.

2. Cars containing explosives must be near center of train and may be together if desired; must be at least 15 cars from engine and 10 cars from caboose when length of train will permit.

3. Cars containing explosives must not be placed next to cars bearing the inflammable or the acid placard or cars containing lighted heaters. Whenever it is possible to avoid so doing they must not be placed next to tank cars or flat cars or next to carloads of lumber, poles, iron, pipe, or other articles liable to break through end of car from rough handling.

4. The air and hand brakes on this car must be in service.

5. In shifting, have a car between this car and engine whenever possible, and do not cut this car off while in motion.

6. Avoid all shocks to this car and couple carefully.

7. Avoid placing it near a possible source of fire.

8. Engines on parallel track must not be allowed to stand opposite or near this car when it can be avoided.

9. This placard must be removed from car when the explosives are unloaded.

1667. A car containing any of the explosives (as prescribed in par. 1661) must not be permitted to leave a station or siding without having the certificates and placard prescribed in paragraphs 1665 and 1666 securely and properly affixed.

1668. (*a*) **Shipper's certificate.**—The shipping order for any package containing an explosive named below must show each article under its proper name as specified in this paragraph, and must show in the lower left-hand corner over the signature of the shipper or of his duly authorized agent, written, or stamped (not printed) with facsimile stamp, the following certificate:

> This is to certify that the above articles are properly described by name and are packed, marked, and are in proper condition for transportation according to the regulations prescribed by the Interstate Commerce Commission.

LIST OF SHIPPING NAMES.

Black powder.
High explosives.
Smokeless powder for cannon.
Smokeless powder for small arms.
Wet fulminate of mercury.
Ammunition for cannon with explosive projectiles.
Ammunition for cannon with empty projectiles.
Ammunition for cannon with sand loaded projectiles.
Ammunition for cannon without projectiles.
Explosive projectiles.
Detonating fuzes.
(Number) blasting caps.
(Number) blasting caps with safety fuse.
(Number) electric blasting caps.
Common fireworks.
Special fireworks.

(*b*) **Waybilling.**—The carrier must see that the shipment is properly described on the revenue waybill under one of the above names and that the correct gross weight is given.

The revenue waybill, card waybill, and envelope containing revenue waybill when used as a card waybill, for a car containing any quantity of the explosives named in paragraph 1661, except a shipment of blasting caps or electric blasting caps not exceeding 500 caps, must have plainly stamped or plainly written across the top the word "EXPLOSIVES" in letters not less than three-eighths of an inch high.

1669. (*a*) If shipments of explosives named in paragraph 1661 are accepted at nonagency stations, provision must be made for the proper certification and placarding of cars, examination of shipments, and loading and staying of packages in cars.

(*b*) Shipments of explosives named in paragraph 1661 must not be unloaded at nonagency stations unless the consignee is there to receive them, or unless proper storage facilities are provided at that point for their protection.

SHIPMENTS FROM CONNECTING LINES.

1670. Cars containing explosives as specified in paragraph 1661 which are offered by connecting lines must be carefully inspected, without unnecessary disturbance of lading, by the receiving line to see that these regulations have been complied with, and the car must not be forwarded until all discovered violations are corrected. (See general rule G.)

Shipments of explosives offered by connecting lines must comply with these regulations, and the revenue waybill, freight bill, manifest of lading, card waybill, switching order, or other billing must bear the indorsement prescribed by paragraph 1668.

HANDLING OF EXPLOSIVES.

1671. In handling packages of explosives at stations and in transferring them to and from cars the greatest care must be taken, and shocks or falls liable to injure the containing package must be avoided. Where an inclined chute is employed such chute shall be constructed of 1-inch planed boards, with side guards 4 inches high extending 3 inches above top face of bottom of chute and throughout its length, fastened with brass screws. D-shaped strips or runners, not more than 6 inches apart and running lengthwise of chute, must be fastened to the upper surface of the bottom board by means of glue and wooden pegs extending through the bottom board and runners. Chutes must be occasionally wiped down with waste moistened with machine oil when dynamite packages are being handled.

A stuffed mattress, 4 feet wide by 6 feet long and not less than 4 inches thick, or a heavy jute or hemp mat of like dimensions, must be placed under the discharging end of the chute.

1672. Careful men must be chosen to handle explosives, the platform and the feet of the men must be as free as possible from grit, and all possible precautions must be taken against fire. Unauthorized persons must not be allowed to have access to explosives at any time while they are in the custody of the carrier. Suitable provision must be made, outside of the station when practicable, for the safe storage of explosives, and every effort possible must be made to reduce the time of this storage. If a shipment of explosives is not removed within 48 hours after notice of arrival at destination (see general rule D), it must be disposed of by return to the shipper, or by storage at the expense of the owner, or by sale, or when necessary to safety by destruction under supervision of a competent person.

Loading in Car.

1674. Packages receive their greatest stresses in a direction parallel to the length of the car and must be loaded so as to offer their greatest resistance in this direction. Boxes of explosives when loaded in the car must rest on their bottoms and with their long dimension parallel to the length of the car. A car must not contain more than 70,000 pounds gross weight of explosives. This limit does not apply to shipments of ammunition.

1675. Explosives packed in round kegs, except when boxed, must be loaded on their sides with heads toward ends of the car; and they must not be placed in the space opposite the doors unless the doorways are boarded on the inside as high as the lading.

Large casks, barrels or drums may be loaded on their sides or ends as will best suit the conditions.

1676. Packages containing any of the explosives for the transportation of which a certified and placarded car is prescribed (see par. 1661) must be stayed (blocked and braced) by the one who loads the car, to prevent change of position by the ordinary shocks incident to transportation.[1] Special care must be used to prevent them from falling to the floor or from having anything fall on them or slide against them during transit. To prevent delays to way-freight trains, when there is more than one shipment of explosives loaded in a "peddle car" or "way car," each shipment must be stayed separately. Forwarding and transfer stations for explosives must be provided with the necessary materials for staying.

Shippers must furnish the material for staying packages loaded by them.

1677. Detonating fuzes or blasting caps, or electric blasting caps, must not be loaded in a car or stored with high explosives of any kind, including explosive projectiles, nor with wet nitrocellulose, nor with smokeless powder for small arms.

1678. Fulminates in bulk must not be loaded with any explosive or inflammable article.

1679. When necessary, detonating fuzes may be assembled in explosive projectiles shipped by the United States Government.

1680. Fireworks must not be loaded in the same car with any other explosive except small-arms ammunition, primers, percussion fuzes, time or combination fuzes, safety fuse, or safety squibs.

1682. Explosives covered by these regulations, other than fireworks, small-arms ammunition, primers, percussion fuzes, time or combination fuzes, safety fuse, or safety squibs, must not be transported in the same car with nor stored on railway property near any of the dangerous articles for which labels are prescribed by the Regulations for the Transportation of Dangerous Articles other than Explosives by Freight.

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[1] For recommended methods see Bureau of Explosives' pamphlet No. 6.

When practicable at any point, certain and separate days should be assigned for receiving from shippers less than carload lots of explosives named in paragraph 1661.

1683. In a car containing explosives all packages of other freight must be so loaded and stayed as to prevent injury to packages of explosives during transit. When it is possible explosives should be loaded so as to avoid transfer at stations.[1]

HANDLING CARS CONTAINING EXPLOSIVES.

1684. Every possible effort must be made to expedite the movement of cars containing explosives.

1685. The phrase "cars containing explosives" as used in this and subsequent paragraphs, excepting paragraph 1697, refers to the explosives specified in paragraph 1661.

Whenever it can be avoided cars containing explosives must not be hauled in a mixed or freight train that carries passengers for hire unless such cars are placed between freight cars not containing explosives or other dangerous articles.

1686. Cars containing explosives must be placed near the middle of the train, and two or more such cars may be placed together if desired. They must be at least 15 cars from the engine and 10 cars from the caboose when length of the train will permit.

In local freight trains, to avoid the danger of otherwise unnecessary switching at way stations, cars containing explosives may be placed not closer than the second car from caboose or the second car from engine.

1687. Cars containing explosives must have air and hand brakes in service. They must not be placed next to cars bearing the inflammable or the acid placard, or cars containing lighted heaters. Whenever it is possible to avoid so doing they must not be placed next to tank cars or flat cars or next to carloads of lumber, poles, iron, pipe, or other articles liable to break through end of car from rough handling.

1688. When handling cars containing explosives in yards or on sidings, they must, if it is practically possible, be coupled to the engine protected by a car between, and they must never be cut off while in motion.

They must be coupled carefully and all unnecessary shocks must be avoided. Other cars must not be allowed to strike a car containing explosives. They must be so placed in yards or on sidings that they will be subject to as little handling as possible, be removed from all danger of fire, and, when avoidable, engines on parallel tracks must not be allowed to stand opposite or near them.

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[1] At stations where it is necessary to handle explosives at night it is recommended that incandescent electric lights be provided.

1689. Under no circumstances must a car known to require the "EXPLOSIVE" placard be taken from a station, including transfer stations, or a siding, unless it is properly carded as per paragraphs 1661 and 1666; nor unless the car is in proper condition.

1690. When a car containing explosives is in a train, the carrier must make proper provision for notifying its train and engine employees of the presence and location of such car in the train before leaving the initial station.

1691. Such cars must be frequently inspected to see that the carding is intact. Whenever any of these cards become detached or lost in transit they must be replaced on arrival at the next division terminal yard.

1692. Unless otherwise arranged for, when a car containing explosives is to be transferred, unloaded, or stored for any purpose, at a given junction, station, or yard, the carrier must provide for due notice by wire to such station of the probable time of arrival and the number of cars (not car numbers) in order that proper provision may be made at that point for handling the same.

1693. At points where trains stop cars containing explosives and adjacent cars must be examined to see if they are in good condition and free from hot boxes or other defects liable to cause damage. If cars containing explosives are set out short of destination for any cause the carrier must arrange that proper notice be given to prevent accident.

1694. Whenever a car containing explosives is opened for any purpose inspection must be made of the packages of explosives to see that they are properly stayed and in good condition and that no box of dynamite is standing on its end or side. Upon the discovery of leaking dynamite or loose powder the defective packages must be carefully removed to a safe place. Loose powder or other explosives must be swept up and carefully removed. If the floor is wet with nitroglycerin, the car is unsafe to use and a local inspector of the Bureau of Explosives should be immediately called to superintend the thorough mopping and washing of the floor with a warm, saturated solution of concentrated lye or sodium carbonate. If necessary, the car must be placed on an isolated siding and proper notice be given. (See pars. 1534 and 1535.)

1695. **Removal of placards.**—The certificates and placards prescribed in paragraphs 1665 and 1666 must be removed from the car as soon as the explosives are unloaded.

IN CASE OF A WRECK.

1697. In case of a wreck involving a car containing explosives, the first and most important precaution is to prevent fire. Although most of the group "High explosives" may burn in small amounts quietly and without causing a disastrous explosion, yet everything possible must be done to keep fire away. Before beginning to clear a wreck in which a car containing explosives is involved all unbroken packages should be removed to a place of safety and as much of the broken packages as possible gathered up and likewise removed, and the rest saturated with water. Many explosives are readily fired by a blow or by the spark produced when two pieces of metal or a piece of metal and a stone come violently together. In clearing a wreck, therefore, care must be taken not to strike fire with tools, and in using the crane or locomotive to tear the wreckage in pieces the possibility of producing sparks must be considered. With most explosives thorough wetting with water practically removes all danger of explosion by spark or blow; but with the dynamites wetting does not make them safe from blows. With all explosives mixing with wet earth renders them safer from either fire, spark, or blow. In case fulminate has been scattered by a wreck, after the wreck has been cleared the top surface of the ground should be removed, and, after saturating the area with oil, be replaced by fresh earth. If this is not done, when the ground and fulminate become dry small explosions may occur when the mixed material is trodden on or struck.

"INFLAMMABLE" PLACARD.

1698. A white placard of diamond shape printed on strong tag board measuring 15 inches on each diagonal, 10¾ inches on each side, and bearing in red and black letters the following inscription, "INFLAMMABLE—KEEP LIGHTS AND FIRES AWAY—HANDLE CAREFULLY," must be placed on each outside end and side of a car containing any quantity of smokeless powder for cannon, or ammunition for cannon with empty projectiles, or ammunition for cannon with sand-loaded projectiles, or ammunition for cannon without projectiles, or fireworks.

REGULATIONS FOR THE TRANSPORTATION OF DANGEROUS ARTICLES OTHER THAN EXPLOSIVES BY FREIGHT.

REGULATIONS FOR THE TRANSPORTATION OF DANGEROUS ARTICLES OTHER THAN EXPLOSIVES BY FREIGHT.

Prescribed under act of Mar. 4, 1909, and sec.15 of the act to regulate commerce, as amended June 18, 1910. Adopted June 2, 1911. Revised Nov. 13, 1911. Published Jan. 1, 1912. Effective Mar. 31, 1912, and superseding regulations published June 20, 1911.

GENERAL NOTICE.

A. Special precautions are necessary in preparing for shipment packages of dangerous articles, other than explosives, and in handling these packages during transit. Any failure of a shipper, or of a carrier, to perform the duties imposed upon him in this respect may be the actual or a contributory cause not only of destructive fires but of disastrous explosions, since large quantities of explosives are transported frequently through thickly populated districts and in trains containing cars loaded with other dangerous articles.

B. Sections 235 and 236 of the act of March 4, 1909, require the shipper of dangerous articles to describe and mark his packages properly and to inform the agent of the carrier of the true character of their contents. Heavy penalties are provided for the shipper who knowingly solicits the transportation of dangerous articles without complying with these requirements, as well as for the carrier that knowingly transports them.

C. To promote the uniform enforcement of law and to minimize the dangers to life and property incident to the transportation by land in interstate commerce of dangerous articles other than explosives, the following regulations are prescribed to define these articles for freight transportation purposes, to state the precautions that must be observed by the shipper in preparing them for shipment, and by the carrier in handling them while in transit. It is the duty of each such carrier to make the prescribed regulations effective and to thoroughly instruct its employes in relation thereto, and of shippers to properly acquaint themselves therewith.

D. Specifications as to containers, methods of packing for shipment, etc., will be considered and prescribed from time to time. Orders prescribing such specifications will be given effective dates as conditions and investigations may appear to warrant. (See pages 75 to 91.)

These regulations are subject to amendment whenever new developments or information demonstrate the advisability of amendment.

E. The Bureau for the Safe Transportation of Explosives and Other Dangerous Articles, hereinafter called Bureau of Explosives, maintained by the railways under the auspices of the American Railway Association, is an efficient bureau in charge of an expert chief inspector. This bureau will make inspections and conduct investigations and will confer with manufacturers and shippers with a view to determining what specifications and regulations will within reasonable limits afford the highest degree of safety in packing and preparing these dangerous articles for shipment and in transporting the same. The Commission will seek to avail itself of the expert knowledge thus developed and, in formulating amendments to these regulations or specifications supplemental thereto, while not bound thereby, will give due weight to such expert opinions.

GENERAL RULES.

L. Carriers that are subject to the act to regulate commerce must not receive shipments of articles defined as dangerous by these regulations when the shipments are not packed, marked, labeled, described, and certified as prescribed herein. The method of manufacture and packing of articles defined as dangerous by these regulations, so far as it affects safe transportation, must be open to inspection by a duly authorized representative of the initial carrier or of the Bureau of Explosives.

M. All shipments of articles defined as dangerous by these regulations offered for transportation in interstate commerce must be properly described by the shipper in his shipping order and bill of lading under the specific or general name provided for the description of such freight by the carrier's classification and tariff governing.

In addition to the specific or general name provided in the classification and tariff, the shipper may also show information on the shipping order and bill of lading descriptive of the article, such as its technical or trade name.

For less than carload shipments each package which contains any dangerous article as defined in these regulations must have plainly marked on the outside thereof, in addition to name and address of the consignee and in addition to the labels required, the proper classification name or tariff name of the article shipped, except when the name of the dangerous article is shown on the label prescribed therefor.

N. All shipments of articles defined as dangerous by these regulations, and for which detailed instructions for packing are not given herein, must be securely packed in containers strong enough to stand without rupture or leakage of contents all ordinary shocks incident to reasonably careful handling during transit. It is the duty of shippers, where leakage from their shipping containers is known to be a probable source of fire or material damage to other freight, to exercise special care in constructing shipping containers for such articles, even though their names do not appear in the list of dangerous articles, paragraph 1807 (*a*).

O. Consignees must remove shipments of dangerous articles from the carrier's property within 48 hours after notice of arrival at destination.

GROUPING.

P. For transportation purposes dangerous articles other than explosives are divided into the following groups:

1. Forbidden articles.
2. Inflammable liquids.
3. Inflammable solids.
4. Oxidizing materials.
5. Corrosive liquids.
6. Compressed gases.

SECTION 1.

INFORMATION AND DEFINITIONS.

Group 1.—Forbidden articles.

1801. The following are forbidden articles:

(*a*) Outside packages containing in the same compartment interior packages, the mixture of whose contents would be liable to cause a dangerous evolution of heat, gas, or corrosive materials.

(*b*) Cylinders containing gases capable of combining chemically.

(*c*) Packages containing dangerous articles in a leaking condition or in such an insecure condition as to make leakage probable during transit.

(*d*) Cotton waste or cotton rags oily with linseed oil.

Group 2.—Inflammable liquids—Red label.

1802. This group includes any liquid or liquid mixture that gives off inflammable vapors (as determined by flash point from Tagliabue's open-cup tester, as used for test of burning oils) at or below a temperature of 80° F. (See par. 1807).

Group 3.—Inflammable solids—Yellow label.

1803. This group includes all substances other than those classified as explosives that are liable under conditions incident to transportation to cause fires by self-ignition through friction, through concussion, through absorption of moisture, or through spontaneous chemical changes. (See par. 1807.)

Group 4.—Oxidizing materials—Yellow label.

1804. This group includes all substances, such as chlorates, permanganates, peroxides, and nitrates, that yield oxygen readily to stimulate the combustion of organic matter. (See par. 1807.)

Group 5.—Corrosive liquids—White label.

1805. This group includes the strong mineral acids and other strongly corrosive liquids that are liable to cause fires when mixed with chemicals or with organic matter, or are liable, in case of leakage from their shipping containers, to damage other freight materially. (See par. 1807.)

Group 6.—Compressed gases—Red or light green (gas) label.

1806. This group includes all inflammable or noninflammable gases assembled for shipment under a pressure exceeding 25 pounds per square inch. (See par. 1807.)

DANGEROUS ARTICLES.

1807. (*a*) The list following shows the names of well-known articles, other than explosives, that are dangerous; the kind of label required on outside packages (see par. 1811); the quantities that may be shipped in one outside package without a label when certified "No label required," and the label exemptions on account of specified packing. (See column 5 of list.)

When several dangerous articles are placed in one outside package without violating these regulations, labels must be applied (see par. 1807 (*d*)), when the combined quantity of the articles of any one group exceeds the lowest limit prescribed by column 3 for any of the articles of that group that are included.

(*b*) When a shipment described under a name not in the following list is defined as a dangerous one by paragraphs 1802 to 1806, inclusive, the shipper must inform the carrier of the fact by use of the proper label prescribed herein, and his shipping order must show the certificate prescribed by paragraph 1814. The maximum quantity of any such article shipped in one outside package, without label, when certified "No label required," must not exceed the limit prescribed by column 3 of the list, for dangerous articles of similar flash point or characteristics. A shipment described under a name not in the following list and on the shipping order with no notation as to labels applied and no shipper's certificate will be assumed by the carrier in the absence of knowledge to the contrary to be not dangerous under these regulations. (See general notice, par. B.)

(*c*) When articles that are not dangerous under the regulations are described under names in the following list marked with (*), the shipper must state on his shipping order, as a part of the description of such article, "No label required" and also furnish the certificate prescribed by paragraph 1814.

(*d*) When dangerous articles requiring the red labels are shipped in the same outside package with dangerous articles requiring yellow or white labels, the outside package must be labeled with the red label only.

(*e*) When dangerous articles as defined herein are in foreign shipments forwarded in interstate commerce in bond, the forwarding agent of the foreign shipper must file with the originating carrier a certified shipping order (see par. 1814) and must see that the packages are properly marked and labeled. (See general rule M and pars. 1811 to 1813.)

LIST OF DANGEROUS ARTICLES.

Names of dangerous articles.	Group names and flash points— Inf. L.—Inflammable liquid. Inf. S.—Inflammable solid. Oxi. M.—Oxidizing material. Cor. L.—Corrosive liquid. Comp. G.—Compressed gas.		Maximum quantity in one outside package which may be shipped without a label when certified "No label required."	Kind of label required, when quantity exceeds the limits prescribed for "No label required."	References for packing requirements, paragraph numbers, remarks for information, and rules for exceptions of similar articles.
1	2		3	4	5
		° F.			
Acetate, amyl	Inf. L.	70–95	1 gallon	Red	Pars. 1822, 1824, and 1825.
Acetate, ethyl	do.	40	do.	do.	Do.
Acetate, methyl	do.	40	do.	do.	Do.
Acetone (ethyl methyl ketone)	do.	35	do.	do.	Do.
Acid, hydrochloric (muriatic)	Cor. L.		5 pints	White	Pars. 1851, 1852, and 1856.
Acid, hydrofluoric	do.		do.	do.	Pars. 1852 and 1854.
Acid, nitrating (mixed acid)	do.		No exemption	do.	Mixed nitric and sulphuric acids; par. 1858.
Acid, nitric	do.		do.	do.	Pars. 1851, 1852, and 1857.
Acid, sulphuric	do.		5 pints	do.	Pars. 1852 and 1855.
Alcohol	Inf. L.	57–65	1 gallon	Red	Pars. 1822, 1824, and 1825.
Alcohol, denatured	do.	40–60	do.	do.	Do.
Alcohol, wood	do.	45	do.	do.	Do.
Ammonium perchlorate	Oxi. M.		25 pounds	Yellow	Pars. 1821 and 1841.
*Asphaltum paint	Inf. L.	0–80	1 gallon	Red	See Paint.
*Asphaltum varnish	do.	0–80	do.	do.	See Varnish.
Barium, chlorate of	Oxi. M.		25 pounds	Yellow	Pars. 1821 and 1841.
Barium, nitrate of, in bags	do.		100 pounds	do.	Do.
Barium peroxide	do.		No exemption	do.	Do.
Barium dioxide	do.		do.	do.	Do.
Benzole (benzene)	Inf. L.	20	1 gallon	Red	Pars. 1822, 1824, and 1825.
Benzine	do.	†0	do.	do.	Pars. 1822 and 1825.
Bromine	Cor. L.		5 pints	White	Par. 1853.
Bronzing liquid	Inf. L.	0–70	1 gallon	Red	Pars. 1822, 1824, and 1825.
Calcium phosphide	Inf. S.		5 pounds	Yellow	Par. 1835.
Carbon bisulphide	Inf. L.	†0	½ gallon	Red	Pars. 1822 and 1825.
Celluloid scrap	Inf. S.		No exemption	Yellow	General rule, par. N.
Cement, leather	Inf. L.	†0	1 gallon	Red	Pars. 1822 and 1825.
*Cement, liquid n. o. s.	do.	0–80	do.	do.	Do.
*Cement, roofing	do.	0–80	do.	do.	Pars. 1822, 1824, and 1825.
Cement, rubber	do.	†0	do.	do.	Pars. 1822 and 1825.
Charcoal, ground or pulverized	Inf. S.		100 pounds (in one shipment).	Yellow	Par. 1833. Charcoal "in bottles," "in boxes," "in barrels," or "in tablets," "case hardening charcoal," "animal charcoal," or "Bone charcoal" is exempt from label and certificate requirements, when so described.

Charcoal, lump	do.		500 pounds (in one shipment).	do.	Par. 1833. Lump charcoal, made from pine wood by old kiln method which provides long air exposure before shipment, and lump charcoal made from soft wood in retorts is exempt from label and certificate requirements when described as "Soft wood charcoal."
Charcoal screenings	do.		No exemption	do.	Par. 1833.
Chloride of sulphur	Cor. L		do.	do.	Pars. 1821, 1851, 1852, and 1855.
*Coal-tar distillate	Inf. L.	0-80	1 gallon	Red	Pars. 1822, 1824, and 1825.
Collodion	do.	†0	do.	do.	Do.
Cologne spirits (alcohol)	do.	60	do.	do.	Do.
Columbian spirits (alcohol, wood)	do.	45	do.	do.	Do.
*Compounds, cleaning, liquid	do.	0-80	do.	do.	Do.
*Compounds, paint or varnish removing, liquid	do.	0-80	do.	do.	Do.
*Compounds, polishing, liquid	do.	0-80	do.	do.	Do.
*Compounds, type cleansing, liquid	do.	0-80	do.	do.	Do.
*Compounds, vulcanizing	do.	0-80	do.	do.	Do.
*Compounds, vulcanizing	Cor. L		do.	White	Pars. 1821, 1851, 1852, and 1855.
Compressed gas:					
Acetylene, including "empty" cylinders that contain an inflammable solvent. (See Note 1.)	Comp. G		No exemption	Red (gas)	Pars. 1861 to 1863.
Air, compressed	do.		do.	Green (gas)	Pars. 1861 and 1862.
Anhydrous ammonia	do.		do.	do.	Do.
Blaugas	do.		do.	Red (gas)	Pars. 1861 to 1863.
Carbonic acid	do.		do.	Green (gas)	Pars. 1861 and 1862.
Chlorine	do.		do.	do.	Do.
Dental	do.		do.	do.	Do.
Hydrogen	do.		do.	Red (gas)	Pars. 1861 to 1863.
Liquefied petroleum gas	do.		do.	do.	Pars. 1824 and 1861 to 1863.
Oxygen	do.		do.	Green (gas)	Pars. 1861 and 1862.
Pintsch	do.		do.	Red (gas)	Pars. 1861 to 1863.
Sulphur dioxide	do.		do.	Green (gas)	Pars. 1861 and 1862.
Compressed gases n. o. s	do.		do.	Red or green (gas).	Pars. 1861 to 1863.
Cotton waste, oily	Inf. S.		do.	Yellow	Cotton waste oily with linseed oil must not be accepted.
*Dressing, leather	Inf. L.	0-80	1 gallon	Red	Pars. 1822, 1824, and 1825.
*Driers, paint or japan	do.	0-80	do.	do.	Do.
*Eradicators, paint or grease, liquid	do.	0-80	do.	do.	Do.
Ether	do.	†0	5 pounds	do.	Pars. 1822 and 1825.
*Extracts, liquid	do.	20-80	1 gallon	do.	Par. 1821. Liquid extracts in glass or metal vessels, not containing more than 1 quart each and securely packed in outside wooden packages, may be shipped without label or certificate when described as "Liquid extracts in glass," or "Liquid extracts in metal." Bark, tanners', and wood extracts are exempt from label and certificate requirements when properly described.
Gasoline. (See Note 1)	do.	† 0	do.	do.	Pars. 1822 and 1825.
High wines (alcohol)	do.	60-80	do.	do.	Pars. 1822, 1824, and 1825.
Hydrocarbon (gas drips)	do.	† 0	do.	do.	Pars. 1822 and 1825.

* See par. 1807 (*c*). † At or below.

NOTE 1.—Automobiles equipped with securely closed acetylene gas cylinders or tanks containing gasoline are exempt from label and certificate requirements.

LIST OF DANGEROUS ARTICLES—Continued.

Names of dangerous articles.	Group names and flash points— Inf. L.—Inflammable liquid. Inf. S.—Inflammable solid. Oxi. M.—Oxidizing material. Cor. L.—Corrosive liquid. Comp. G.—Compressed gas.		Maximum quantity in one outside package which may be shipped without a label when certified "No label required."	Kind of label required, when quantity exceeds the limits prescribed for "No label required."	References for packing requirements, paragraph numbers, remarks for information, and rules for exceptions of similar articles.
1	2		3	4	5
		°F.			
* Insecticide, liquid	Inf. L.	0–80	1 gallon	Red	Pars. 1822, 1824, and 1825.
Lacquer	do	20–70	do	do	Do.
Lead, nitrate of	Oxi. M.		100 pounds	Yellow	Pars. 1821 and 1841.
Liquefied petroleum gas	Inf. L.	† 0	No exemption	Red	Pars. 1822, 1824, and 1825.
Matches, "strike anywhere" (friction)	Inf. S.		do	Yellow	Pars. 1821 and 1836.
Naphtha	Inf. L.	† 0	1 gallon	Red	Pars. 1822 and 1825.
Nitrocellulose, wet with solvent	do	40	No exemption	do	Must contain not less than 30 per cent by weight of a solvent whose flash point is not lower than 40° F. and must be packed in glass bottles (par. 1824) or in securely closed metal vessels that will stand the drop and pressure tests prescribed for metal barrels. (Specification No. 5, page 82.)
Nitrocellulose or nitrostarch, wet with 20 per cent water	Inf. S.		do	Yellow	Par. 1834. Dry nitrocellulose and dry nitrostarch are high explosives.
* Oil, gas	Inf. L.	0–80	1 gallon	Red	Pars. 1822, 1824, and 1825.
Paint, aluminum, bronzing, or gold	do	0–70	do	do	See Paint.
* Paint	do	0–80	do	do	Pars. 1822, 1824, and 1825. Paint or varnish, liquid, with flash point not lower than 50° F. may be shipped without label or certificate when in securely closed metal cans containing not more than 5 gallons in each can; the cans complying with par. 1822; or with flash point not lower than 20° F. in securely closed bottles or cans containing not more than 1 gallon in each vessel; the cans or bottles packed in strong boxes or barrels and described as "Paint in metal cans," "Varnish in metal cans," "Paint in glass," or "Varnish in glass." Paint or varnish, liquid, with flash point below 80° F., not so packed, must be labeled and certified. Dry paints, earth paints, and paste paints are exempt from label and certificate requirements when properly described.

Pentane	do	† 0	½ gallon	do	Pars. 1822 and 1825.
Perchlorate of ammonium	Oxi. M.		25 pounds	Yellow	Par. 1841.
Perchlorate of potash	do		do	do	Pars. 1821 and 1841.
Permanganate of potash	do		do	do	Do.
* Petroleum, crude	Inf. L.	0–80	1 gallon	Red	Pars. 1822, 1824, and 1825.
* Petroleum distillate	do	0–80	do	do	Do.
Petroleum ether	do	† 0	do	do	Pars. 1822 and 1825.
Petroleum naphtha	do	† 0	do	do	Do.
Petroleum spirits	do	† 0	do	do	Do.
Phosphorus (white or yellow)	Inf. S.		No exemption	Yellow	Par. 1832.
Picric acid, wet with 20 per cent water	do		do	do	Par. 1834. Picric acid, dry, is a high explosive.
* Polish, metal, liquid	Inf. L.	0–80	1 gallon	Red	Pars. 1822, 1824, and 1825.
Potash, bromate	Oxi. M.		25 pounds	Yellow	Pars. 1821 and 1841.
Potash, chlorate of	do		do	do	Do.
Potash, nitrate of, in bags	do		do	do	Do.
Potassium, metallic	Inf. S.		No exemption	do	Par. 1831.
Rags, oily	do		do	do	Cotton rags oily with linseed oil must not be accepted.
Saltpeter, in bags	Oxi. M.		100 pounds	do	Pars. 1821 and 1841.
Shellac, liquid	Inf. L.	40–70	1 gallon	Red	Pars. 1822, 1824, and 1825.
Soda, chlorate of	Oxi. M.		25 pounds	Yellow	Pars. 1821 and 1841.
Soda, nitrate of, in bags	do		100 pounds	do	Do.
Soda, nitrite of	Oxi. M		25 pounds	do	Do.
Sodium, metallic	Inf. S.		No exemption	do	Par. 1831.
Sodium peroxide	Oxi. M.		do	do	Pars. 1821 and 1841.
Strontia, nitrate of, in bags	do		100 pounds	do	Do.
Sulphur, chloride of	Cor. L.		5 pints	White	Pars. 1821, 1851, 1852, and 1855.
Sulphur dioxide	Comp. G.		No exemption	Green (gas)	Pars. 1861 and 1862.
Tri-nitrotoluol, wet with 20 per cent water	Inf. S.		do	Yellow	Par. 1834. Tri-nitrotoluol, dry, is a high explosive.
Toluol (toluene)	Inf. L.	55	1 gallon	Red	Pars. 1822, 1824, and 1825.
* Varnish	do	0–80	do	do	See Paint.
Zinc flue dust	Inf. S.		10 pounds	Yellow	General rule, par. N.

* See par. 1807 (*c*).

† At or below.

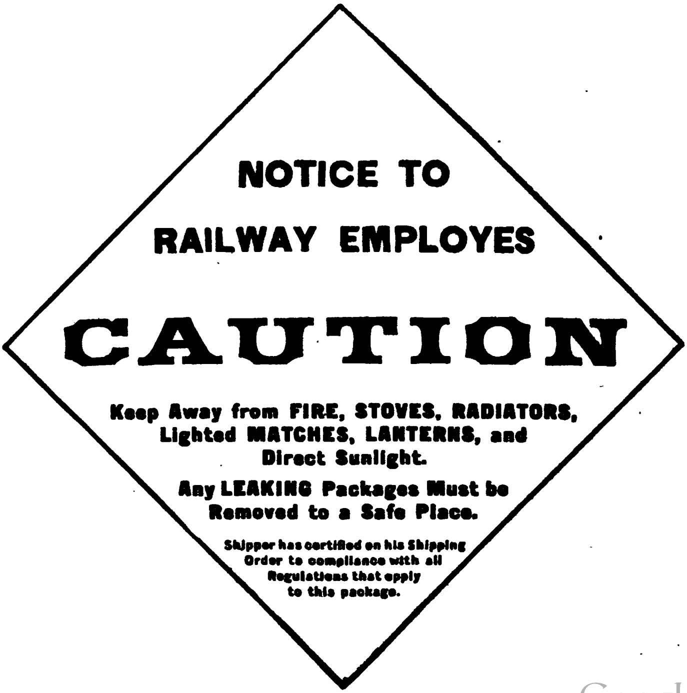
LABELS.

1811. Unless exempted on account of quantity or method of packing, all packages containing dangerous articles named in the list, paragraph 1807 (*a*), and similar articles defined by paragraphs 1802 to 1806, inclusive, must be conspicuously labeled by the shipper. Labels should be applied when practicable to that part of the package bearing the consignee's name and address. Labels will not be required on packages in carload shipments to be unloaded by the consignee, but the proper placards must be obtained from the carrier and applied by the shipper to the car loaded by him. When it is known, however, that subsequent shipments of these packages in less-than-carload quantities, and in the original outside packages, will probably be made by the consignee, the original manufacturing shipper may attach labels to the packages. Shippers must furnish and attach the labels prescribed for their packages. Labels must not be applied to packages containing articles which under these regulations are not dangerous.

1812. Labels must be of diamond shape, with each diagonal (not sides) 5¾ inches long. The color is *red* for inflammable liquids and compressed inflammable gases, *yellow* for inflammable solids and oxidizing materials, *light green* for noninflammable compressed gases, and *white* for corrosive liquids.

1813. The wording must be in black letters and as follows, unless a modified wording with an identification number and name of shipper is authorized to meet special conditions:

Red label for inflammable liquids (reduced size).



NOTICE TO

RAILWAY EMPLOYES

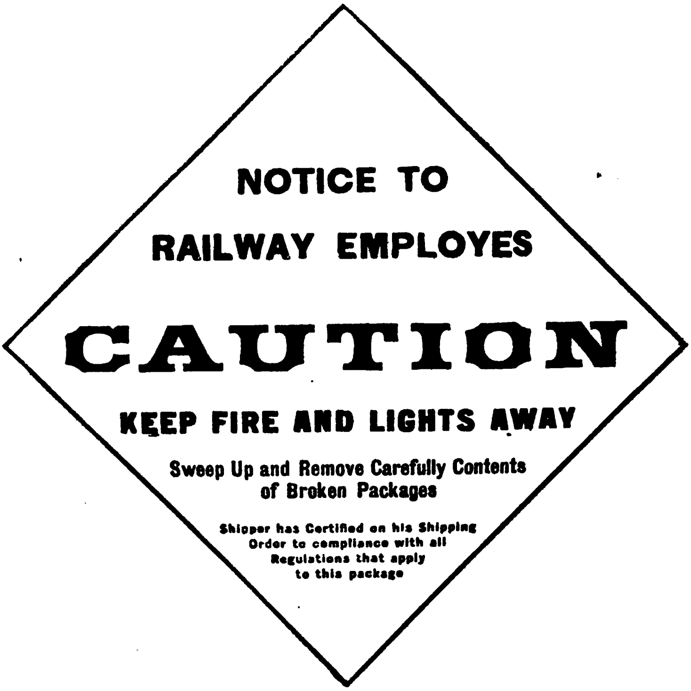
CAUTION

Keep Away from FIRE, STOVES, RADIATORS,
Lighted MATCHES, LANTERNS, and
Direct Sunlight.

Any LEAKING Packages Must be
Removed to a Safe Place.

Shipper has certified on his Shipping
Order to compliance with all
Regulations that apply
to this package.

Yellow label for inflammables (reduced size).



NOTICE TO

RAILWAY EMPLOYES

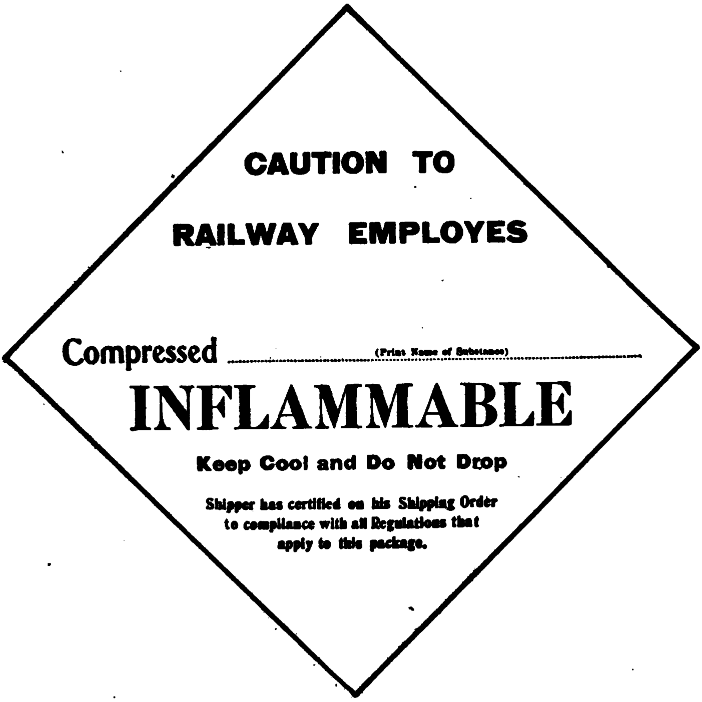
CAUTION

KEEP FIRE AND LIGHTS AWAY

Sweep Up and Remove Carefully Contents
of Broken Packages

Shipper has Certified on his Shipping
Order to compliance with all
Regulations that apply
to this package

Red label for inflammable gases (reduced size).



CAUTION TO

RAILWAY EMPLOYES

Compressed ....(Print Name of Substance)............................

INFLAMMABLE

Keep Cool and Do Not Drop

Shipper has certified on his Shipping Order
to compliance with all Regulations that
apply to this package.

Light green label for non-inflammable gases (reduced size).

CAUTION TO

RAILWAY EMPLOYES

Compressed ....(Print Name of Substance)............................

NON-INFLAMMABLE

Keep Cool and Do Not Drop

Shipper has certified on his Shipping Order
to compliance with all Regulations that
apply to this package.

White label for acids (reduced size).

NOTICE

HANDLE CAREFULLY

ACID

DO NOT LOAD WITH EXPLOSIVES OR
INFLAMMABLES PROTECTED
BY YELLOW LABELS

Shipper has certified on his Shipping Order to
compliance with all Regulations that
apply to this package.

SHIPPING ORDERS.

1814. The shipping order for any dangerous article as defined in paragraphs 1802 to 1806, inclusive, whether labels are required or not, unless specially exempted account of packing (par. 1807, column 5), must show in the lower left-hand corner over the signature of the shipper or of his duly authorized agent, written or stamped (not printed) with facsimile stamp, the following certificate:

> This is to certify that the above articles are properly described by name and are packed and marked and are in proper condition for transportation according to the regulations prescribed by the Interstate Commerce Commission.

The shipping order must also show opposite the entry of the article the kind of label applied, or "No label required." For carload lots of such articles loaded by the shipper the shipping order must show the kind of placard applied to the car, or "No placard required."

RULES FOR PACKING.

1821. Dangerous articles for which yellow and white labels, respectively, are prescribed must not be packed in the same package, and compressed gases must not be packed with other articles.

1822. (*a*) The construction of barrels, drums, boxes, cans, carboys, or other containers purchased hereafter and used for shipments of dangerous articles other than explosives must conform to specifications approved by the Interstate Commerce Commission and each container must be stamped, labeled, or marked "This container complies with I. C. C. shipping container specification No. —." Requirement will later be established that upon specified dates all containers used shall conform to the specifications prescribed.

(*b*) Pending approval and promulgation by the Commission of specifications for types of shipping containers other than those for which specifications are published herein, containers may be used which under tests made by the Bureau of Explosives or by other competent testing laboratory in the presence of a representative of the Bureau of Explosives are shown to possess the general efficiency and the protection against leakage of contents afforded by the standard types of corresponding capacity described in the specifications published herein provided they are labeled or marked to show compliance with this requirement. (See pp. 75 to 91.)

(*c*) Tank cars must comply with Master Car Builders' rules, and must be carefully inspected by the shipper before loading. A tank car that leaks or one that has any defect which would make leakage during transit probable must not be used to ship any kind of inflammable liquid.

Group 2.—Inflammable liquids—Red label.

1824. All inflammable liquids in this group must be shipped in well-stoppered glass or earthenware vessels of not exceeding 1 gallon capacity, cushioned in wooden barrels or boxes; or in metal cans or wooden kits of capacity not exceeding 10 gallons in barrels or boxes (not jacketed or crated); or in well-stoppered carboys, cushioned and boxed; or in strong tight wooden kegs or barrels thoroughly coated on the interior, that must be carefully inspected and recoopered when necessary; or in iron or steel barrels or drums; or in tank cars, provided the vapor tension of the inflammable liquid corresponding to a temperature of 100° F. (90° F. November 1 to March 1) does not exceed 10 pounds per square inch.

Liquefied petroleum gas is a condensate from the "casing head gas" of petroleum oil wells, whose vapor tension at 100° F. (90° F. November 1 to March 1) exceeds 10 pounds per square inch. Liquefied petroleum gas must be shipped in metal drums or barrels which comply with "Shipping container specification No. 5," page 82, or in tank cars especially constructed and approved for this service by the Master Car Builders' Association. When the vapor pressure at 100° F. exceeds 25 pounds per square inch, cylinders as prescribed for compressed gases (see paragraphs 1861 to 1863, inclusive) must be used.

NOTE.—The Commission has not deemed it best at this time to prohibit the use of good wooden barrels in shipping inflammable liquids with a flash point below 20° F. It is, however, expected that their use for that purpose will be gradually discontinued and that within a reasonable time metal barrels will come into general use for such shipments.

1825. Packages containing inflammable liquids must not be entirely filled. Sufficient interior space must be left vacant to prevent distortion of containers when heated to a temperature of 120° F. This vacant space must not be less than 2 per cent of the capacity of the container, including the dome capacity of tank cars.

Group 3.—Inflammable solids—Yellow label.

1831. Metallic sodium or potassium, in quantity not greater than 1 pound, must be placed in neutral oil, and this in a well-stoppered bottle protected by a tin container and boxed; or these substances may be packed in hermetically sealed tin cylinders, boxed; or in tight iron drums.

1832. White or yellow phosphorous must be placed in water in sealed metal vessels inclosed in wooden boxes.

1833. (*a*) Charcoal made in ovens or in retorts must be cooled thoroughly in air-tight containers and it must be exposed thereafter to the atmosphere under conditions favorable to good circulation of air through the charcoal in order to remove the danger of spontaneous ignition. Charcoal made in retorts and transferred to air-tight metal cans may be cooled in 24 hours; but charcoal burned in slatted cars should be kept for two periods of 24 hours each in first and secondary cooling chambers respectively. After proper cooling the exposure of the charcoal to good fresh-air circulation must continue for not less than 44 consecutive hours and a total of 72 hours must elapse before a car loaded with it is closed for shipment.

(*b*) Lump charcoal must be dry and free from screenings and must be loaded in a box car with tight doors closed. Cars should be swept before loading and a car which has contained lime must not be used without thorough cleaning.

(*c*) Charcoal screenings consist of small pieces varying from about one-half inch in their maximum dimension to grains of charcoal dust. Experience shows these screenings to be more liable than other forms of charcoal to cause fires, and when they are wet or have been wet they must not be offered for shipment.

(*d*) Charcoal screenings, or ground or pulverized charcoal, must be packed in tight boxes or barrels; or in strong and securely closed paper bags; or in strong bags with tight paper linings; or in strong jute bags containing not more than 4 bushels each. Bags of screenings, or ground or pulverized charcoal, must be loaded in a way to secure good ventilation during transit. The gross weight of ground or pulverized charcoal, or of screenings, loaded into one car in bags must not exceed 24,000 pounds; tight cars must be used and doors must be closed to prevent entrance of rain or sparks.

(*e*) Before a car loaded with charcoal by a shipper is forwarded it must be inspected by a competent representative of the shipper, and when signs of heating are observed the car must be unloaded, or ventilated and detained under observation of the shipper as long as may be necessary to avoid the danger of fire.

1834. Nitrocellulose, nitrostarch, picric acid, or tri-nitrotoluol, uniformly wet with not less than 20 pounds of water to 80 pounds of dry material must be placed in waterproof containers, securely packed in a strong and tight box, keg, or barrel, and marked "WET NITROCELLULOSE—20 PER CENT WATER," or "WET NITROSTARCH—20 PER CENT WATER," or "WET PICRIC ACID—20 PER CENT WATER," or "WET TRI-NITROTOLUOL—20 PER CENT WATER."

1835. Calcium phosphide must be placed in hermetically-sealed metal cans inclosed in metal-lined wooden boxes; or this material may be shipped in securely closed iron or steel barrels.

1836. "Strike anywhere" (friction) matches must be packed in inside pulpboard, strawboard, wooden or metallic boxes containing not more than 1,000 matches each, except that paper wrappings may be used for block or card matches; and the contents of all match boxes, 300 nominal count and over, unless packed loosely with heads lying in all directions, must be packed with approximately half the heads lying in opposite directions. If packed loosely not to exceed 2,000 matches may be packed in one carton or inside package. The inside packages must be placed in strong outside boxes plainly marked "STRIKE ANYWHERE MATCHES," and constructed in accordance with specifications approved by the Interstate Commerce Commission. "Strike anywhere" (friction) matches packed and marked prior to October 1, 1911, may be shipped under such packing and marking until July 1, 1912. "Strike anywhere" matches must not be packed in the same outside package with any other articles.

Group 4.—Oxidizing materials—Yellow label.

1841. (*a*) Oxidizing materials and acids must not be packed together, and packages bearing white labels must not be loaded in the same car with packages bearing yellow labels. (See par. 1801 (*a*) and 1851.)

(*b*) The safest packing of oxidizing materials is in strong and tight metal-lined or metal packages. When metal-lined or metal packages are not available strong and tight boxes, kegs, or barrels must be used for the strong oxidizing materials such as the nitrites, chlorates, peroxides and permanganates.

(*c*) Nitrates may be shipped in bags or in bulk in tight cars.

(*d*) It is important to prevent contact of these materials with combustible substances and especially with the finely divided combustible substances such as sawdust, shavings, or sweepings, that may be present in freight cars.

Group 5.—Corrosive liquids—White label.

1851. Acids named in paragraph 1807 (*b*) must not be packed in the same compartment of an outside package that contains one or more substances with which the acid might, on rupture of inside packages, combine chemically and cause a dangerous evolution of heat, gas, or corrosive materials.

1852. All carboys used for the shipment of acids named in paragraph 1807 (*a*) must be made and tested by the manufacturer under specifications approved by the Interstate Commerce Commission. (See par. 1822.) Straight-sided carboys, as distinguished from the "balloon" carboys, must be used for all shipments of nitric acid or nitric acid mixtures, and for less-than-carload shipments of the other dangerous acids.

1853. Bromine must be in glass bottles of not more than one-half gallon capacity or earthenware vessels of not more than two gallons capacity with glass or earthenware stoppers well secured. These vessels must be packed in strong barrels or wooden boxes cushioned by noncombustible packing material such as whiting, mineral wool, or sifted ashes. Sawdust, hay, or excelsior, saturated with 25 per cent olution of calcium chloride, may be used.

1854. Hydrofluoric acid must be packed in india rubber or ceresine bottles hermetically sealed, or in lead carboys well stoppered, and the bottles and carboys packed in strong wooden boxes or barrels; or in tight hardwood barrels or in wooden tank cars, lined with asphaltum or similar protective coating. The barrels and tank cars must be securely hooped and carefully inspected by the shipper.

1855. Sulphuric acid and anhydrous liquid chlorides must be in well-stoppered earthenware or glass vessels packed in strong barrels or wooden boxes, or in strong carboys (see par. 1852), or in metal drums or barrels or tank cars. The inner containers must be well cushioned by excelsior, hay, straw, or equivalent packing material.

1856. Hydrochloric acid must be packed as prescribed for sulphuric acid, except that it must not be shipped in unlined wooden or iron barrels, drums or tank cars.

1857. (*a*) Special attention must be given to bottles or vessels of any kind used for nitric acid.

(*b*) Nitric acid must be in well-stoppered earthenware or glass bottles, or in straight-sided glass carboys (see par. 1852), packed in strong barrels or wooden boxes with strong handles or cleats and well cushioned by material that will not be ignited in case of breakage, such as mineral wool, sifted ashes, whiting, kiesel-guhr, acid-proof fiber covers, etc.; and the necks of carboys must be protected by wooden or metal hoods securely attached to the box.

(*c*) The vessels or carboys containing nitric acid of gravity below 1.43 may be well cushioned by other material, but this material must be such that it will not be ignited by the acid in case of breakage.

1858. (*a*) Mixed nitric and sulphuric acids must be shipped in securely closed iron drums that comply with the drop and pressure tests prescribed in specifications for types of metal barrels approved by the Interstate Commerce Commission (see par. 1822 (*b*)) or in tank cars; or mixed nitric and sulphuric acids may be shipped in carboys packed as specified for strong nitric acid (see par. 1857), provided these carboys are placed in a tight cylindrical iron case covering the bottom and sides of the carboy and the space between the bottle and case is filled with noncombustible cushioning material and the case fits tightly in the outside wooden box.

Group 6.—Compressed gases—Red or light green (gas) label.

1861. (*a*) Gases that may combine chemically must not be shipped in one cylinder. Cylinders purchased hereafter for the shipment of compressed gases must be made in accordance with specifications approved by the Interstate Commerce Commission.

(*b*) By water jacket, or other suitable tests, each cylinder used for shipping liquefied gases must be subjected at least once in five years to a uniform interior pressure not less than one and one-quarter times the interior pressure that would result from heating the cylinder uniformly, in its maximum charged condition, to a temperature of 130° F. Each cylinder used for shipping under pressure not exceeding 1,000 pounds per square inch nonliquefied gases or gases in solution must be subjected at least once in five years to a uniform interior pressure not less than twice the charging pressure for such cylinder, corresponding to a temperature of 70° F. When the charging pressure exceeds 1,000 pounds per square inch, the test pressure must not be less than one and one-half times the charging pressure. A cylinder must be condemned when it leaks, when the permanent expansion is due to local weakness, or when it is uniform and exceeds 5 per cent of the total expansion. When the charging pressure is less than 300 pounds per square inch, it will not be necessary to measure the permanent expansion in quinquennial pressure tests, provided the cylinder in question has previously passed this test.

(*c*) The weight of gas charged into any cylinder must not, at a temperature of 130° F., cause an interior pressure in excess of three-fourths of the elastic limit of the weakest part of the cylinder.

(*d*) A cylinder filled with such charging density of any gas as would produce failure in the test prescribed for that gas must not be shipped.

(*e*) After December 31, 1914, all cylinders must be plainly stamped with the date of last test—for example, "4–09" for April, 1909—or otherwise durably marked to show compliance with this rule, and by December 31, 1911, not less than one-fourth of the cylinders in use for shipping purposes must be thus tested and marked.

(*f*) Cylinders containing acetylene gas must be made of tough steel and must be completely filled with a porous material that has been tested by the Bureau of Explosives and approved by the Interstate Commerce Commission, and this material must be charged with acetone or its equivalent not to exceed 40 per cent of the interior volume capacity of the cylinder. The pressure in cylinders containing acetylene gas must not exceed 250 pounds per square inch at a temperature of 70° F.

1862. After December 31, 1914, each cylinder containing liquefied gases or gases in solution or other gases under more than 300 pounds per square inch pressure, must be equipped with a safety device approved by the Interstate Commerce Commission that will prevent explosion of the normally charged cylinder when it is placed in a fire.

1863. When cylinders containing inflammable gases are not boxed for shipment, the safety device and discharge valve must be made safe from injury during transit by a design and construction of the cylinder, or they must be protected by strong metal caps that can not be detached by rolling the cylinder.

SECTION 2.

RULES FOR CARRIERS.

1871. In handling packages containing dangerous articles at stations and to and from cars care must be taken to prevent their falling or being broken. Heavy packages should be trucked, rolled, or moved by use of skids or other satisfactory devices and must not be dropped from platform or cars.

1872. The originating carrier must see, for a shipment offered to it and known to contain dangerous articles named in the list, paragraph 1807 (*a*), that the necessary labels appear and that the shipping order, switching ticket, or other written request for transportation bears the proper description with certificate and label or placard notation.

1873. The revenue or other waybill prepared from the shipping order, and transfer billing to connecting carrier for articles in list, paragraph 1807 (*a*), and for other articles when properly offered for shipment as dangerous articles, must properly describe these articles by name and state for less-than-carload shipments the color of label applied, or "No label required." For carload shipments (see par. 1811) they must show the kind of placard applied, or "No placard required." The shipper's certificate (see par. 1814) must be in possession of the initial carrier when these indorsements are made.

1874. (*a*) The card waybill, or running slip, or envelope containing waybills for any car which under these regulations should bear the inflammable or acid placards must have plainly stamped or written across the top the words "Inflammable" or "Acid."

(*b*) When an unplacarded car is not accompanied by the revenue waybill but is accompanied by a card waybill or substitute which shows that the lading includes one or more of the articles marked with an asterisk in the list, paragraph 1807 (*a*), the card waybill or substitute must be indorsed "No placard required" as prescribed for the revenue waybill.

(*c*) When the original movement is over a switching line the switching ticket, and copies thereof, prepared by the shipper, or by the carrier under the shipper's written authority, must bear the shipper's certificate and the placard notation prescribed by paragraph 1814; for other switching movement the switching ticket prepared by a railway employe must show the kind of placard required.

1875. (*a*) A tank car loaded with a dangerous article named in the list, paragraph 1807 (*a*), or an empty tank car whose last lading was an inflammable liquid (see par. 1903), or a tank car loaded with an article properly offered for shipment as a dangerous article must be placarded and the card waybill, running slip, or switching ticket must be indorsed "Inflammable" or "Acid."

(*b*) When an empty tank car is to be moved the owner of it must inform the carrier, either directly or through the consignee who received the loaded car, of the name of the last contents and the carrier must use this information to indorse the billing as per paragraph 1874 (*a*) or to show by the name of last contents that no placard is required.

1876. An astray shipment of dangerous articles other than explosives, or a shipment discovered in transit (not at originating point) to have been made in violation of these regulations, must be forwarded promptly to destination, if known, provided a careful inspection shows the package to be in proper condition for safe transportation. (See par. 1945.) If the package is unlabeled and the exact nature of its contents is unknown, the red label which gives the greatest protection should be applied, and the revenue or other waybill covering such shipment must be indorsed "Inspected at ——— station, ——— R. R., ———, 191—, and ——— label applied." An "astray bill" must show the color of label applied and be indorsed as follows:

Astray shipment, inspected at, ... Station .... Railroad ....
191....

1877. Shipments of dangerous articles offered by connecting water or other transportation lines must comply with these regulations. Packages must be properly certified and labeled, and the card and revenue waybills must bear the indorsements prescribed by paragraph 1873.

1878. Packages of dangerous articles offered for shipment and not properly packed, described, marked, labeled, and certified must not be accepted by the carrier until these regulations are complied with.

Loading.

1891. A car placarded "INFLAMMABLE," or known to contain inflammable liquids must not be entered with a lighted lantern, torch, or other fire until both car doors have been opened and sufficient time allowed for ventilation and escape of any vapors. The presence of these vapors will generally be indicated by characteristic odors. Packages protected by white and yellow labels, respectively, must not be loaded in the same car or stored together.

Packages protected by labels must be loaded so that they can not fall to the car floor and so that other packages of freight can not fall on them.

1892. (*a*) Carload lots of "strike anywhere" (friction) matches must be loaded as compactly as possible to avoid motion, especially lengthwise the car. Car doorways should be boarded on the inside to keep packages from contact with the doors, and the inside lining of the car should be supplemented when necessary by strips nailed to the car and close enough together to keep the boxes from being jammed against the studding and broken by high pressures on small areas. The strongest dimension of the box should be loaded lengthwise the car.

(*b*) When packages are loaded over or near draft bolts or king-bolts, the bolts should be covered by boards not less than 1 inch thick, and the ends of these boards should be beveled to prevent the end of a box resting against the end of the board and being crushed by it. Partial layers of boxes should be interlocked with the lower layers as described in Bureau of Explosives Pamphlet No. 6, for loading packages of explosives. The cars used should be made secure against the entrance of sparks or rain and should be the strongest cars available. Under no condition should any car be loaded with more than 48,000 pounds gross weight of "strike anywhere" matches.

(*c*) Less-than-carload lots of matches should be carefully loaded so that they can not fall to the car floor and so that other packages of freight can not fall on or injure them. Whenever practicable the packages of matches should be placed to facilitate ready removal from the car in case of fire. A smoking box of matches should not be broken open; the fire will cease of itself if air can be kept from it.

1893. (*a*) Carboys of acid or other corrosive liquids must be so blocked and braced that they can not change position during transit when being handled with reasonable care.

(*b*) When less-than-carload shipments are loaded with other freight the carboys must be placed near the doorways and must have wooden strips not less than 1 inch thick nailed to the car floor about 6 inches from the carboy boxes. These strips must be arranged so that the liquid from a broken carboy will drain toward the doorway and outside the car. The space between the strips and the floor braces, or blocking used for staying the carboy boxes, must be covered liberally with clean and dry sand (not sawdust or other combustible material).

(*c*) Empty carboys in less-than-carload lots must be supplied with stoppers and neck protectors (see par. 1857 (*b*)) well secured, and they must be loaded with their necks up. Whenever practicable they should not be loaded in cars containing valuable or perishable freight.

1894. (*a*) Carload lots of crude camphor, cotton, cotton batting, cotton wadding, cotton waste, excelsior, fiber, hay, hemp, jute, oakum, oil-well cables, rags, sawdust, sulphur, tow, or straw, or other articles liable to be ignited by sparks, as well as unslacked lime and calcium carbide, both of which must be protected from water, should when practicable be loaded in tight cars, with doors stripped, and when practicable these cars must not be placed next to cars placarded "EXPLOSIVES."

(*b*) Lime, coke, chipped bone, ashes, or similar substances must not be loaded in cars until thoroughly cooled.

(*c*) Charged electric batteries must be well insulated to prevent short circuits and must not be loaded or stored with explosives.

1895. Empty barrels or drums previously used for the shipment of an article in the list, paragraph 1807 (*a*), must have their filling and vent holes plugged, and fire must be kept away from them. They should be loaded in open or stock cars when practicable.

Placards and Handling Cars.

1901. Carriers must keep on hand an adequate supply of labels and placards. Lost or detached labels must be replaced from information given on revenue or other waybill. Placards will be furnished by carriers to shippers for attachment to cars loaded by them, and labels must be furnished by shippers.

1902. The carrier must attach the proper placard, or verify the attachment of it by the shipper, as soon as a tank car, loaded or empty, or other car requiring a placard is accepted by the carrier for transportation.

1903. When the lading requiring the placard is removed from cars, placards must be removed, except that "INFLAMMABLE" placards must remain on *tank* cars moved as "empty" until such cars are known to have been properly cleaned with steam or reloaded with a substance that does not require the "INFLAMMABLE" placard.

1904. A carrier must not move from a station or siding a car known to require placards until the proper placards are attached. Placards lost in transit must be replaced by the carrier.

1905. Tank cars placarded "INFLAMMABLE" must be placed in trains, if possible, at least five cars from the engine and five cars from the caboose. When length of train does not permit this, they must be placed as near the middle of the train as practicable; and in all cases carriers must see that their train crews are informed of the presence and location of such cars in the train.

Special care must be taken to avoid rough treatment and unnecessary switching of placarded tank cars.

1906. When cars protected by "INFLAMMABLE" placards are received or held in yards, particularly at night, the carrier must see that all necessary precautions are taken to prevent accidents. These precautions must include provision for quickly isolating them in case of fire.

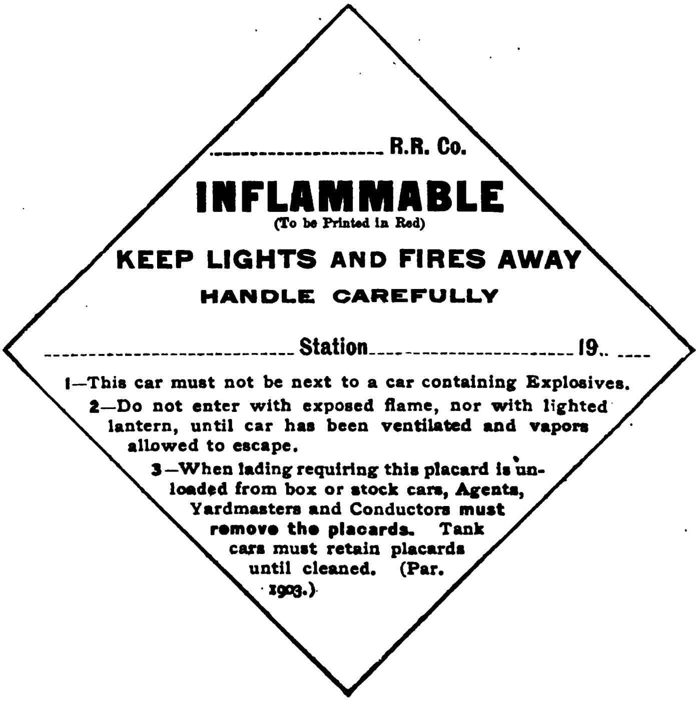
1907. In classification yards, and in switching, it must be determined by inspection and trial that such a car has its brakes in firstclass order before a draft containing it is cut; and a tank car placarded "INFLAMMABLE" must not be started down a ladder track, incline, or hump until the preceding car has cleared the ladder. It also must clear the ladder before another car is allowed to follow.

1908. Cars bearing "INFLAMMABLE" placards and cars adjacent to them must be watched with extra care to discover hot journals.

All available opportunities must be utilized, by noting the odor of inflammable liquids or otherwise, to discover leaks in these cars and to protect leaking cars from ignition of contents by flame of inspector's lanterns or torches, by burning fusees, by switch lights, by switch-thawing flames, by fires on side of track, by coals from locomotives passing over a roadbed strewn with leakage, or otherwise. (See par. 1956.)

1909. A placard of diamond shape, printed on strong, thin, white paper when pasted on tank cars, and on strong tag board for tacking to wooden cars or to wooden boards of suitable size attached for this purpose to tank cars, measuring 15 inches on each diagonal, 10¾ inches on each side, and bearing in red and black letters the following inscription, must be securely attached to each outside end and to each side of a car containing one or more packages protected by the *red* or the *yellow* diamond label. (See par. 1811.)

Inflammable placard (reduced size).



-------------------- R.R. Co.

INFLAMMABLE

(To be Printed in Red)

KEEP LIGHTS AND FIRES AWAY

HANDLE CAREFULLY

---------------------------- Station ---------------------- 19.. ----

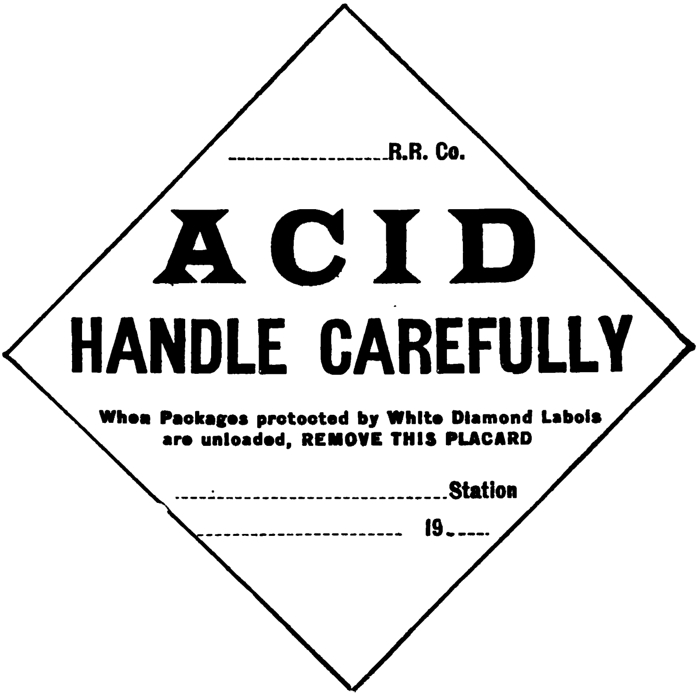
1—This car must not be next to a car containing Explosives.

2—Do not enter with exposed flame, nor with lighted lantern, until car has been ventilated and vapors allowed to escape.

3—When lading requiring this placard is unloaded from box or stock cars, Agents, Yardmasters and Conductors must remove the placards. Tank cars must retain placards until cleaned. (Par. 1903.)

1941. There must be securely attached to each outside end and to each side of a car containing one or more packages protected by the *white* diamond label a placard of diamond shape on strong, thin white paper when pasted on tank cars and on strong tag board for tacking to wooden cars or to wooden boards of suitable size attached to tank cars, measuring 12 inches on each diagonal, 8½ inches on each side, and bearing in black letters the following inscription. (See par. 1811.)

Acid placard (reduced size).



------------------R.R. Co.

ACID

HANDLE CAREFULLY

When Packages protected by White Diamond Labels are unloaded, REMOVE THIS PLACARD

------------------------------Station

----------------------- 19----

1942. When a car contains both red and white labeled packages the inflammable placard only will be required.

1943. Inflammable or acid placards will not be required on express or baggage cars in charge of an express messenger or railway employee and moving in passenger trains.

1944. Labels and placards must conform to standards, and samples will be furnished by the chief inspector of the Bureau of Explosives on request.

1945. Violations of these regulations and accidents or fires in connection with the transportation or storage on railway property of dangerous articles must be reported by the carrier to the chief inspector of the Bureau of Explosives, 30 Vesey Street, New York.

Serious violations, such as the discovery of leaking packages of dangerous articles, and all accidents must be thus reported without delay. Clerical and routine errors not liable to be the immediate cause of accidents should be noted and corrected and reported periodically.

In Case of a Wreck.

1946. In case of a wreck involving a car containing inflammable freight it should be assumed that packages are broken and that leakage has occurred which may cause fire if lighted lanterns or other flames are taken into or near these cars. As much of the train as possible should be moved to a place of safety. A car containing inflammable freight should be opened for ventilation and packages protected by red labels and cylinders of compressed gases should be removed to a safe place. Substances spilled from broken packages protected by yellow label should also be carefully removed. Cylinders of compressed gases may be exploded if they are exposed to fire or struck a sharp blow and the flying fragments would then be dangerous. Inflammable liquids spilled from broken packages or tank cars should be well covered with dry earth before a lighted lantern, torch, or an engine is used in the vicinity. Acids spilled in cars should be covered with dry earth and the car floor should be thoroughly swept.

Wrecks Involving Oil Cars.

1951. Action in any particular case will depend upon existing conditions, and good judgment will be necessary to avoid disastrous fires on the one hand and the useless sacrifice of valuable property on the other.

Volatile (or combustible) liquids, such as gasoline, naphtha, etc., in large quantity and spread over a large surface will form vapors that will ignite at a considerable distance, depending on the kind and quantity of liquid and the direction and force of the wind. Many of the liquids, regarded as safe to carry under ordinary conditions and transported in tank cars without the inflammable placard, should still be treated as dangerous in handling a wreck.

1952. When oil cars are leaking all lights or fires near them that can possibly be dispensed with should be extinguished or removed. Incandescent electric lights or portable electric flashlights should be used when available. Whenever practicable the work of handling a wrecked oil car should be done during daylight.

Lanterns necessarily used for signaling should be kept on the side from which the wind is blowing and at as high an elevation as can be obtained. The vapors will go with the wind but not against it. The ash pan and fire box of a locomotive or steam derrick, especially on the side of a wrecked or leaking tank car toward which the wind is blowing, is a source of danger. Wrecks involving oil cars should in no case be approached with lighted pipes, cigars, or cigarettes.

1953. To prevent explosion of loaded tank cars that are not supplied with safety valves and are in immediate danger of being subject to heat from a fire, and that can not be removed to a place of safety, the manholes should be opened, but not unless and only while subject to this danger.

1954. Effort should be made to prevent the spread of oil over a large surface by collecting it in any available vessels or draining it into a hole or depression at a safe distance from the track. When necessary, trenches should be dug for this purpose.,

It is not safe to drain inflammable oil in large quantities into a sewer, since vapors may thus be carried to distant points and there ignited. Care should be exercised also not to permit oil to drain into streams of water which may be used by irrigation plants or for watering stock. Dry earth spread over spilled oil will decrease the rate of evaporation and the danger. A stream of oil on the ground should be dammed and dry earth be thrown on the liquid as it collects.

1955. Sudden shocks or jars that might produce sparks or friction should be avoided. When possible, jack the wrecked cars carefully into position after removing other cars and freight that might be injured by fire. Only as a last resort, to meet an emergency, should a wrecked tank car be moved by dragging, and when this is done all persons should be kept at a safe distance.

1956. No unnecessary attempt should be made to transport a damaged tank car from which inflammable liquid is leaking. If wrecked or derailed, and not in a position to obstruct or endanger traffic, it should have its leak stopped as far as possible and be left under guard until another tank car or sufficient vessels can be provided for the transfer of the liquid, which should be transferred by pumping when practicable.

Even a tank that is not leaking is liable to be ruptured by use of slings, and the slipping of chain slings may produce sparks. Saving of the contents of the tank is not as important as the prevention of fire.

1957. An empty or partially empty tank car, with or without placards, is very liable to contain explosive gases, and lights must not be brought near it.

1958. **Water will not quench an oil fire.**—If the fire can not be smothered by use of earth, steam, or wet blankets, effort should be concentrated on confining it and saving other property.

1959. Should a leak occur by the breaking or displacement of the unloading valve and pipe at the bottom of the tank car, it may be stopped by removing the dome cap on the top of the tank and dropping the plunger into the plunger seat, as a shock sufficient to damage the outlet valve and pipes may have unseated also the plunger.

REGULATIONS FOR THE TRANSPORTATION OF EXPLOSIVES AND OTHER DANGEROUS ARTICLES BY EXPRESS.

REGULATIONS FOR THE TRANSPORTATION OF EXPLOSIVES AND OTHER DANGEROUS ARTICLES BY EXPRESS.

Prescribed under act of Mar. 4, 1909, and sec. 15 of the act to regulate commerce as amended June 18, 1910. Formulated and published January 1, 1912. Effective March 31, 1912.

GENERAL NOTICE.

A. Special precautions are necessary in preparing for shipment by express packages of explosives and other dangerous articles. Any failure of the shipper or of a carrier to perform the duties imposed upon him in this respect may be the actual or contributory cause of a serious accident or fire.

B. Sections 235 and 236 of the act of March 4, 1909, require the shipper of explosives or other dangerous articles to describe and mark his packages properly, and to inform the agent of the carrier of the true character of the contents. Heavy penalties are provided for the shipper who knowingly solicits the transportation of dangerous articles without complying with these requirements, as well as for the carrier that knowingly transports them.

C. To promote the uniform enforcement of the law and to provide for the safe transportation by express service in interstate commerce of such explosives and other dangerous articles as can be transported legally and safely on passenger trains, the following regulations are prescribed to define these articles for express transportation purposes, to state the precautions that must be observed by the shipper in preparing them for shipment and by the express carrier in handling them while in transit.

D. Specifications as to containers, methods of packing for shipment, etc., will be considered and prescribed from time to time. Orders prescribing such specifications will be given effective dates as conditions and investigations may appear to warrant. (See pages 75 to 91.)

These regulations are subject to amendment whenever new developments or information demonstrate the advisability of amendment, and, if it is determined that any of the articles described herein can not be transported by express carriers on passenger trains without unduly endangering life or property or the vehicle in which other articles are transported, the Commission will direct that such dangerous articles shall not be transported.

E. The Bureau for The Safe Transportation of Explosives and Other Dangerous Articles, organized by the railways under the auspices of the American Railway Association, hereinafter called **Bureau of Explosives**, is an efficient bureau in charge of an expert chief inspector. This bureau will make inspections and conduct investigations, and will confer with manufacturers and shippers and express carriers with a view of determining what regulations will, within reasonable limits, afford the highest degree of safety in packing and preparing dangerous articles for shipment and in transporting the same. The Commission will seek to avail itself of the expert knowledge thus developed and in formulating amendments to these regulations, while not bound thereby, will give due weight to such expert opinions.

GENERAL RULES.

1. Express carriers that are subject to the act to regulate commerce must make the prescribed regulations effective, and must provide for the thorough instruction of their employes therein, and shippers must properly acquaint themselves therewith. Express carriers must not receive shipments of articles defined as dangerous by these regulations when the shipments are not packed, marked, labeled, described, and certified as prescribed herein. Explosives and dangerous articles, the transportation of which by passenger trains is prohibited by law, must not be shipped. The method of manufacturing and packing of articles defined as dangerous by these regulations, so far as it affects safe transportation, must be open to inspection by a duly authorized representative of the initial carrier, or of the Bureau of Explosives.

2. All shipments of articles defined as dangerous by these regulations, offered for transportation by express in interstate commerce, must be properly described by the shipper, and the proper name of the dangerous article must be marked on the outside of the package, in addition to the labels required herein, except when the name of the dangerous article is shown on the label prescribed therefor. Articles for which detailed instructions for packing are not given herein must be securely packed in containers strong enough to stand without rupture or leakage of contents the shocks incident to reasonably careful handling during transit.

GROUPING.

3. For transportation by express, explosives and other dangerous articles are divided into the following groups:

1. Forbidden articles.
2. Permitted explosives.
3. Inflammable liquids.
4. Inflammable solids.
5. Oxidizing materials.
6. Acids and corrosive liquids.
7. Compressed gases.

Group 1.—Forbidden Articles.

4. The following articles must not be shipped by express, except as provided in section 232 of the act of March 4, 1909. (See par. 5 (*a*)):

(*a*) Black powder.

(*b*) High explosives, including nitroglycerin explosives, chlorate powders, nitrate of ammonia powders, dry picric acid, dry picrates, dry nitrocellulose (gun cotton, negative cotton), dry nitrostarch or dry tri-nitrotoluol.

(*c*) Smokeless powder for cannon.

(*d*) Smokeless powder for small arms, except in ammunition for small arms.

(*e*) Fulminate of mercury or of any other metal, except in manufactured products not forbidden.

(*f*) Blasting caps, including electric blasting caps.

(*g*) Ammunition for cannon, with or without projectiles.

(*h*) Detonating fuzes.

(*i*) Explosive projectiles.

(*j*) Liquid nitroglycerin.

(*k*) Fireworks that combine an explosive and a detonator or blasting cap.

(*l*) Fireworks containing a match tip or head, or similar igniting point or surface, unless each such individual tip, head, igniting point or surface is entirely covered and securely protected from accidental contact or friction with any other surface.

(*m*) Fireworks that ignite spontaneously when subjected for 48 consecutive hours in the presence of moisture to the temperature of boiling water.

(*n*) Firecrackers whose dimensions exceed 5 inches in length or $\frac{3}{4}$ inch in diameter, or whose explosive charges exceed 45 grains each in weight.

(*o*) Toy torpedoes or caps exceeding 1½ inches in diameter or containing more than an average of $\frac{35}{100}$ of a grain of explosive composition per cap.

(*p*) Fireworks that can be exploded en masse by a commercial detonator placed in one of the units, or by impact of a rifle bullet, or otherwise.

(*q*) Explosives or other dangerous articles properly condemned by the Bureau of Explosives.

(*r*) Outside packages containing in the same compartment interior packages the mixture of whose contents would be liable to cause a dangerous evolution of heat, gas, or corrosive materials.

(*s*) Cylinders containing gases capable of combining chemically.

(*t*) Packages containing a dangerous article in a leaky condition, or in such an insecure condition as to make leakage probable during transit.

(*u*) Cotton waste or cotton rags oily with linseed oil.

(*v*) Boxes that have been previously used for high explosives must not be again used for shipments of any character.

Group 2.—Permitted Explosives.

5. The following explosives may be accepted for transportation by express, when offered in compliance with these regulations:

(*a*) Samples of explosives for laboratory examination when properly packed and not exceeding a net weight of ½ pound for each sample, and not exceeding 20 such samples at one time in a single vessel or vehicle. (See pars. 4, 6, and 14.)

(*b*) Small-arms ammunition.

(*c*) Small-arms primers.

(*d*) Cannon primers.

(*e*) Percussion fuzes, including tracer fuzes.

(*f*) Time or combination fuzes.

(*g*) Safety fuse.

(*h*) Safety squibs.

(*i*) Common fireworks and special fireworks, except when forbidden. (See par. 4.)

DEFINITIONS OF PERMITTED EXPLOSIVES.

6. The only samples of explosives that can lawfully be shipped by express are those intended for examination in a chemical laboratory.

7. Small-arms ammunition (such as is used in sporting or fowling pieces, or in rifle, pistol practice, etc.), consists usually of a paper or metallic shell, the primer and the powder charge—with or without shot or bullet—the materials necessary for one firing being all in one piece.

8. Percussion and time fuzes and primers are devices used to ignite the black powder bursting charges of projectiles, or the powder charges of ammunition. For small-arms ammunition the primers are usually called "small-arms primers" or "percussion caps." Percussion tracer fuzes consist of a device which is attached to a projectile and contains a slow-burning composition, to show the flight of projectiles at night.

9. Safety fuse consists ordinarily of a core of mealed black powder, which is surrounded by yarn, tape, pitch, rubber, etc.

10. Safety squibs are small paper tubes containing a small quantity of black powder, one end of each tube being twisted and generally tipped with sulphur.

11. Fireworks include everything that is designed and manufactured primarily for the purpose of producing a visible or audible pyrotechnic effect by combustion or by explosion. They consist of common fireworks and special fireworks.

12. Common fireworks include all that depend principally upon nitrates to support combustion, and not upon chlorates; that contain no phosphorus and no high explosive sensitive to shock or friction; that produce their effect through color display rather than by loud noises. If noise is the principal object, the units must be small and of such nature and manufacture that they will explode separately and harmlessly, if at all, when one unit is ignited in a packing case. They must not be designed for ignition by shock or friction. Examples are Chinese firecrackers, Roman candles, pin wheels, colored fires, rockets, serpents, railway fusees, flash powders, etc.

13. Special fireworks include all that contain any quantity of phosphorus, a fulminate or other high explosive sensitive to shock or friction; or that contain units of such size that the explosion of one while being handled would produce a serious injury; or that require a special appliance or tool, mortar, holder, etc., for their safe use; or that are designed for ignition by shock or friction. Examples are giant firecrackers, bombs, and salutes not forbidden by paragraph 4, toy torpedoes and caps, ammunition pellets fired in a special holder, railway torpedoes, etc.

PACKING AND MARKING OF PERMITTED EXPLOSIVES.

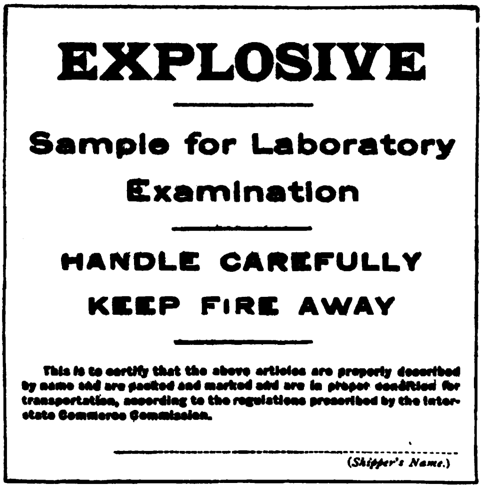
SAMPLES FOR LABORATORY EXAMINATION.

14. *Packing.*—Samples of explosives for laboratory examination must be placed in well-secured metal cans or glass bottles or in strong waterproof paper or cardboard packages containing not more than one-half pound each, and the interior package must be placed in dry sawdust or similar cushioning material in a strong and tight wooden box, with ends not less than 1 inch thick, and top, bottom, and sides not less than ½ inch thick when a nailed box is used, or with ends, top, bottom, and sides not less than ½ inch thick when of lock-cornered construction.

15. *Weight.*—Not more than 20 half-pound samples of explosives for laboratory examination may be placed in one outside box or transported at one time.

16. *Marking.*—Each outside package containing samples of explosives for laboratory examination must have securely and conspicuously attached to it a square red certificate label measuring 4 inches on each side and bearing in black letters the following:

Red label for samples of explosives (reduced size).



EXPLOSIVE

Sample for Laboratory
Examination

HANDLE CAREFULLY
KEEP FIRE AWAY

This is to certify that the above articles are properly described by name and are packed and marked and are in proper condition for transportation, according to the regulations prescribed by the Interstate Commerce Commission.

....
(Shipper's Name.)

SMALL-ARMS AMMUNITION, PRIMERS, FUZES, SAFETY FUSE, AND SAFETY SQUIBS.

17. *Packing.*—Small-arms ammunition must be packed in pasteboard or other boxes, and these pasteboard or other boxes must be packed in strong outside boxes. Small-arms ammunition, in pasteboard or other boxes and in quantity not exceeding a gross weight of 75 pounds, may be packed with nonexplosive and noninflammable articles, and with small-arms primers or percussion caps, provided the shipment is certified and the outside package is plainly marked "SMALL-ARMS AMMUNITION."

18. Primers and percussion and time fuzes must be packed in strong, tight, wooden boxes, with special provision for securing individual packages of primers and fuzes against movement in box.

19. Small-arm primers containing anvils must be packed in cellular packages with partitions separating the layers and columns of primers, so that the explosion of a portion of the primers in the completed shipping package will not cause the explosion of all of the primers.

20. Percussion caps may be packed in metal or other boxes containing not more than 500 caps, but the construction of the cap and the kind and quantity of explosives in each must be such that the explosion of a part of the caps in the completed shipping package will not cause the explosion of all of the caps.

21. Small-arms primers and percussion caps may form a part of the gross weight of 75 pounds of small-arms ammunition that may be packed with other articles as authorized by paragraph 17.

22. Safety fuse and safety squibs must be packed in strong, tight wooden boxes or barrels.

23. *Weight.*—The gross weight of one outside package containing small-arms ammunition, primers, percussion caps, or percussion or time fuzes must not exceed 150 pounds.

24. *Marking.*—Each outside box must be plainly marked "SMALL-ARMS AMMUNITION," or "SMALL-ARMS PRIMERS—HANDLE CAREFULLY," or "PERCUSSION CAPS—HANDLE CAREFULLY," or "CANNON PRIMERS—HANDLE CAREFULLY," or "COMBINATION PRIMERS—HANDLE CAREFULLY," or "PERCUSSION FUZES—HANDLE CAREFULLY," or "COMBINATION FUZES—HANDLE CAREFULLY," or "PERCUSSION TRACER FUZES—HANDLE CAREFULLY," or "SAFETY FUSE," or "SAFETY SQUIBS," etc.

25. (*a*) *Packing.*—Common fireworks must be in a finished state, exclusive of mere ornamentation, as supplied to the retail trade, and must be securely packed in strong, tight, spark-proof wooden boxes or barrels and each outside package must be plainly marked "COMMON FIREWORKS—KEEP FIRE AWAY."

(*b*) Special fireworks must be in a finished state, exclusive of mere ornamentation, as supplied to the retail trade, and must not contain forbidden explosives. (See par. 4.) They must be packed in strong, tight, spark-proof wooden boxes or barrels.

Lock-corner boxes must be made of sound lumber and the thickness must not be less than ⅜ inch for a gross weight of 30 pounds or under; and for a gross weight exceeding 30 pounds and not exceeding 65 pounds the ends must not be less than 9/16 inch, with sides, tops, and bottoms ⅜ inch thick. When the gross weight exceeds 65 pounds the ends must be battened.

If nailed boxes are used of the same thickness of lumber specified for lock-corner boxes, horizontal and vertical cleats not less than ¾ of the thickness of the ends and not less than 1⅞ inches wide must be used on the ends; or in the absence of such cleats, the tops, sides, and bottoms must be thicker by 3/16 inch and the ends thicker by ¼ inch than specified for lock-corner boxes.

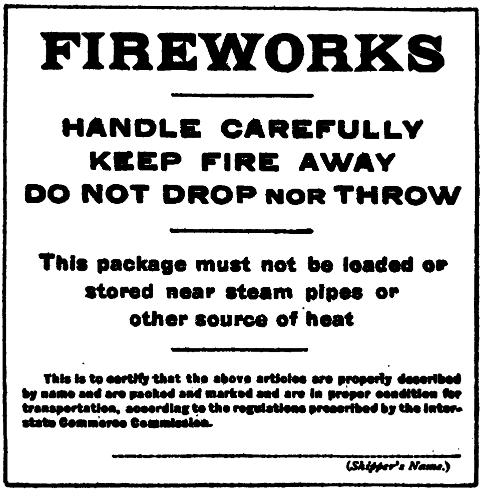
All boxes must be tongued and grooved.

26. *Weight.*—The gross weight of one outside package containing special fireworks must not exceed 100 pounds, and the gross weight of a package containing toy torpedoes must not exceed 65 pounds.

27. *Marking.*—All outside boxes or barrels containing special fireworks or a mixture of common and special fireworks must be spark proof and must be plainly marked "SPECIAL FIREWORKS—HANDLE CAREFULLY—KEEP FIRE AWAY."

28. *Label.*—Each outside package containing common or special fireworks must have securely and conspicuously attached to it a square red certificate label measuring 4 inches on each side and bearing in black letters the following:

Red label for fireworks (reduced size).



FIREWORKS

HANDLE CAREFULLY
KEEP FIRE AWAY
DO NOT DROP NOR THROW

This package must not be loaded or
stored near steam pipes or
other source of heat

This is to certify that the above articles are properly described by name and are packed and marked and are in proper condition for transportation, according to the regulations prescribed by the Interstate Commerce Commission.

____
(Shipper's Name.)

DEFINITIONS OF DANGEROUS ARTICLES OTHER THAN EXPLOSIVES.

Group 3.—Inflammable Liquids—Red Label.

29. This group includes any liquid or liquid mixture that gives off inflammable vapors (as determined by flash point from Tagliabue's open cup tester as used for test of burning oils) at or below a temperature of 80° F.

Group 4.—Inflammable Solids—Yellow Label.

30. This group includes all substances other than those classified as explosives that are liable under conditions incident to transportation to cause fires by self-ignition through friction, through concussion, through absorption of moisture, or through spontaneous chemical changes.

Group 5.—Oxidizing Materials—Yellow Label.

31. This group includes all substances such as chlorates, permanganates, peroxides, and nitrates, that yield oxygen readily to stimulate the combustion of organic matter.

Group 6.—Acids and Corrosive Liquids—White Label.

32. This group includes the strong mineral acids and other strongly corrosive liquids that are liable to cause fires when mixed with chemicals or with organic matter, or are liable, in case of leakage from their shipping containers, to damage other freight materially.

Group 7.—Compressed Gases—Red or Light Green (Gas) Label.

33. This group includes all inflammable or noninflammable gases assembled for shipment under a pressure exceeding 25 pounds per square inch.

Other Dangerous Articles.

34. (*a*) The list following shows the names of well-known articles, other than explosives, that are dangerous, the kind of label required on outside packages, and the quantity that may be shipped in one outside package by express.

(*b*) When a shipment described by and marked with a name not in the following list is defined as a dangerous one by paragraphs 29, 30, 31, 32 and 33, the shipper must inform the express carrier of the fact by use of the proper label, and must give the certificate prescribed herein.

(*c*) When articles other than explosives that are not dangerous under the regulations are described by names in the list following (pages 63–64) marked with (*), the shipper must plainly mark or stencil on each outside package containing such articles the words "NOT DANGEROUS," or affix a white rectangular label measuring 2 by 4 inches, bearing in black letters the words "NOT DANGEROUS."

(*d*) When dangerous articles other than explosives requiring red labels are shipped in the same outside package with dangerous articles requiring yellow or white labels, the outside package must be labeled with the red label only. The marking and description must be that of the inflammable liquid present in largest quantity.

(*e*) When several dangerous articles are placed in one outside package without violating these regulations, the combined quantity of any one group must not exceed the lowest limit prescribed for any one of the articles of that group that is included.

LIST OF DANGEROUS ARTICLES OTHER THAN EXPLOSIVES.

Names of dangerous articles.	Group names and flash points: Inf. L.—Inflammable liquid. Inf. S.—Inflammable solid. Oxi. M.—Oxidizing material. Cor. L.—Corrosive liquid. Comp. G.—Compressed gas.		Kind of label required.	Maximum quantity which may be shipped in one outside package, subject to requirements as to packing (see pars. 35 to 59, inclusive).
1	2		3	4
		° *F.*		
Acetate, amyl	Inf. L.	70–95	Red	5 gallons.
Acetate, ethyl	do	40	do	Do.
Acetate, methyl	do	40	do	Do.
Acetone (ethyl methyl ketone)	do	35	do	Do.
Acid, hydrochloric (muriatic)	Cor. L.		White	1 quart (3 pounds).
Acid, hydrofluoric	do		do	Do.
Acid, nitrating (mixed acid)	do		do	Do.
Acid, nitric	do		do	Do.
Acid, sulphuric	do		do	Do.
Alcohol	Inf. L.	57–65	Red	5 gallons.
Alcohol, denatured	do	40–60	do	Do.
Alcohol, wood	do	45	do	Do.
Ammonium perchlorate	Oxi. M.		Yellow	25 pounds.
*Asphaltum paint	Inf. L.	0–80	Red	12 gallons (see par. 38).
*Asphaltum varnish	do	0–80	do	Do.
Barium, chlorate of	Oxi. M.		Yellow	25 pounds.
Barium, nitrate of	do		do	Do.
Barium peroxide	do		do	1 pound.
Barium dioxide	do		do	Do.
Batteries, charged storage	Cor. L.		White	No limit.
Benzole (benzene)	Inf. L.	20	Red	1 gallon.
Benzine	do	†0	do	Do.
Bromine	Cor. L.		White	1 quart (3 pounds).
Bronzing liquid	Inf. L.	0–70	Red	5 gallons (see par. 37).
Calcium phosphide	Inf. S.		Yellow	1 pound.
Cement, leather	Inf. L.	†0	Red	1 gallon.
*Cement, liquid, n. o. s.	do	0–80	do	1 gallon (see par. 37).
*Cement, roofing	do	0–80	do	5 gallons (see par. 37).
Cement, rubber	do	†0	do	1 gallon.
Charcoal, ground or pulverized	Inf. S.		Yellow	100 pounds.
Charcoal, lump	do		do	Do.
*Chemicals	Inf. L.		Red	See par. 37.
Do	Inf. S.		Yellow	See par. 40.
Do	Oxi. M.		do	See par. 48.
Do	Cor. L.		White	See par. 51.
Chloride of sulphur	do		do	1 quart (3 pounds).
*Coal-tar distillate	Inf. L.	0–80	Red	1 gallon (see par. 37).
Collodion	do	†0	do	1 gallon.
Cologne spirits (alcohol)	do	60	do	5 gallons.
Columbian spirits (alcohol, wood)	do	45	do	Do.
*Compounds, cleaning, liquid	do	0–80	do	1 gallon (see par. 37).
*Compounds, paint or varnish removing, liquid.	do	0–80	do	5 gallons (see par. 37).
*Compounds, polishing, liquid	do	0–80	do	1 gallon (see par. 37).
*Compounds, type cleansing, liquid.	do	0–80	do	Do.
*Compounds, vulcanizing, liquid	do	0–80	do	Do.
Do	Cor. L.		White	1 quart.
Compressed gas:				
Acetylene, including "empty" cylinders that contain an inflammable solvent.	Comp. G.		Red (gas)	No limit.
Air, compressed	do		Green (gas)	Do.
Air, liquid	do		do	Do.
Anhydrous ammonia	do		do	Do.
Blaugas	do		Red (gas)	Do.
Carbonic acid	do		Green (gas)	Do.
Chlorine	do		do	Do.

* See par. 34 (*c*).

† At or below.

LIST OF DANGEROUS ARTICLES OTHER THAN EXPLOSIVES—Continued.

Names of dangerous articles.	Group names and flash points: Inf. L.—Inflammable liquid. Inf. S.—Inflammable solid. Oxi.M.—Oxidizing material. Cor. L.—Corrosive liquid. Comp. G.—Compressed gas.		Kind of label required.	Maximum quantity which may be shipped in one outside package, subject to requirements as to packing (see pars. 35 to 59, inclusive).
1	2		3	4
Compressed gas—Continued.		° F.		
Dental	Comp. G		Green (gas).	No limit.
Hydrogen	do		Red (gas)	Do.
Liquefied petroleum gas	do		Red (gas)	No limit (see par. 38, *c*).
Oxygen	do		Green (gas).	No limit.
Pintsch	do		Red (gas)	Do.
Sulphur dioxide	do		Green (gas).	Do.
Compressed gases, n. o. s	do		Red or green (gas).	Do.
Corrosive liquids, n. o. s	Cor. L		White	1 quart (3 pounds).
Cotton waste, oily	Inf. S		Yellow	25 pounds.
*Dressing, leather	Inf. L	0–80	Red	1 gallon (see par. 37).
*Driers, paint or japan	do	0–80	do	5 gallons (see par. 37).
*Drugs	do		do	See par. 37.
Do	Inf. S		Yellow	See par. 40.
Do	Oxi. M		do	See par. 48.
Do	Cor. L		White	See par 51.
*Eradicators, paint or grease, liquid.	Inf. L	0–80	Red	1 gallon (see par. 37).
Ether	do	† 0	do	25 pounds, in 1-pound tins.
*Extracts, liquid	do	20–80	do	5 gallons (see par. 37).
Gasoline	do	† 0	do	1 gallon.
High wines (alcohol)	do	60–80	do	5 gallons.
Hydrocarbon (gas drips)	do	† 0	do	1 gallon.
*Insecticide, liquid	do	0–80	do	1 gallon (see par. 37).
Lacquer	do	20–70	do	5 gallons.
Lead, nitrate of	Oxi. M		Yellow	25 pounds.
Liquefied petroleum gas	Inf. L	† 0	Red	1 gallon (see par. 38 (*c*)).
Matches, safety	Inf. S		Yellow	25 pounds.
Matches, "strike anywhere" (friction).	do		do	40 pounds, gross weight.
Moving-picture films	do		do	100 pounds.
Naphtha	Inf. L	† 0	Red	1 gallon.
Nitrocellulose, wet with solvent.	do	40	do	10 pounds.
Nitrocellulose or nitro starch, wet with 20 per cent water.	Inf. S		Yellow	10 pounds net.
*Oil, gas	Inf. L	0–80	Red	1 gallon (see par. 37).
Paint, aluminum, bronzing or gold.	do	0–70	do	12 gallons (see par. 38).
*Paint	do	0–80	do	12 gallons (see par. 38).
Pentane	do	† 0	do	1 gallon.
Perchlorate of ammonium	Oxi. M		Yellow	25 pounds.
Perchlorate of potash	do		do	Do.
Permanganate of potash	do		do	Do.
*Petroleum, crude	Inf. L	0–80	Red	5 gallons (see par. 37).
*Petroleum distillate	do	0–80	do	1 gallon (see par. 37).
Petroleum ether	do	† 0	do	1 gallon.
Petroleum naphtha	do	† 0	do	Do.
Petroleum spirits	do	† 0	do	Do.
Picric acid, wet with 20 per cent water.	Inf. S		Yellow	10 pounds.
*Polish, metal, liquid	Inf. L	0–80	Red	1 gallon (see par. 37).
Potash, bromate	Oxi. M		Yellow	25 pounds.
Potash, chlorate of	do		do	Do.
Potash, nitrate of	do		do	Do.
Potassium, metallic	Inf. S		do	1 pound.
Rags, oily	do		do	25 pounds.
Saltpeter, in bags	Oxi. M		do	25 pounds.
Shellac, liquid	Inf. L	40–70	Red	5 gallons.
Soda, chlorate of	Oxi. M		Yellow	25 pounds.
Soda, nitrate of	do		do	Do.
Soda, nitrite of	do		do	Do.
Sodium, metallic	Inf. S		do	1 pound.
Sodium, peroxide	Oxi. M		do	Do.
Strontia, nitrate of	do		do	25 pounds.
Sulphur, chloride of	Cor. L		White	1 quart.
Sulphur dioxide	Comp. G		Green (gas)	No limit.
Tri-nitrotoluol, wet with 20 per cent water.	Inf. S		Yellow	10 pounds.
Toluol (toluene)	Inf. L	55	Red	5 gallons.
*Varnish	do	0–80	do	12 gallons (see par. 38).
Zinc flue dust	Inf. S		Yellow	10 pounds.

* See par. 34 (*c*).

† At or below.

RULES FOR PACKING.

35. Dangerous articles for which yellow and white labels are prescribed, respectively, must not be packed in the same outside package, and compressed gases must not be packed with other articles.

36. The construction of boxes, cans, or other containers used for shipments of dangerous articles other than explosives must conform to specifications approved by the Interstate Commerce Commission.

Group 3.—Inflammable Liquids—Red Label.

37. Not more than the quantity specified (see par. 34, column 4) may be packed in one outside package.

The maximum quantity of any inflammable liquid not otherwise prescribed placed in one outside package must not exceed 1 gallon when flash point is 20° F. or below, or 5 gallons when flash point is above 20° F. and below 80° F.

38. (*a*) Except as herein prescribed all inflammable liquids in this group must be placed in well-stoppered glass, earthenware, or metal vessels of not exceeding 1 gallon capacity, cushioned in strong wooden barrels or boxes, or in metal cans packed in wooden boxes and conforming to "Shipping container specification No. 2," page 76.

(*b*) Paint or varnish with flash point above 20° F. and below 80° F. may be shipped when placed in metal cans of not exceeding 5 gallons capacity, and in quantities not exceeding 12 gallons in one package, when cans and boxes conform to "Shipping container specification No. 2;" or in metal barrels or drums, of not more than 55 gallons capacity when such barrels or drums conform to "Shipping container specification No. 5," page 82.

(*c*) Liquefied petroleum gas, blended or unblended, when its vapor tension corresponding to a temperature of 100° F. exceeds 10 pounds per square inch must not be shipped by express except in steel cylinders conforming to paragraphs 57, 58, and 59.

39. Vessels containing inflammable liquids must not be entirely filled. Sufficient interior space must be left vacant to prevent distortion of containers when heated to a temperature of 120° F. This vacant space must not be less than 2 per cent of the capacity of the container.

Group 4.—Inflammable Solids—Yellow Label.

40. The maximum quantity of any inflammable solid not otherwise prescribed (see par. 34, column 4) placed in one outside package must not exceed 25 pounds.

41. Inflammable solids for which detailed instructions for packing are not prescribed herein must be packed in tight and strong outside

wooden boxes, and the interior packages must be so cushioned and secured that no rupture of either can result from the ordinary shocks incident to transportation.

42. Metallic sodium or potassium, in quantity not greater than 1 pound, must be placed in neutral oil, and this in a well-stoppered bottle protected by a tin container and boxed; or these substances may be packed in hermetically sealed tin cylinders, boxed.

43. Moving picture films must be placed in metal cases, packed in strong and tight wooden boxes or fiberboard pails.

44. Nitrocellulose, nitrostarch, picric acid, or tri-nitrotoluol, uniformly wet with not less than 2 pounds of water to 8 pounds of dry material, must be placed in waterproof containers securely packed in a strong and tight box and marked "WET NITROCELLULOSE—20 PER CENT WATER," or "WET NITROSTARCH—20 PER CENT WATER," or "WET TRI-NITROTOLUOL—20 PER CENT WATER."

45. Calcium phosphide must be placed in hermetically sealed metal cans inclosed in metal-lined wooden boxes.

46. "Strike anywhere" (friction) matches must be packed in inside pulpboard, strawboard, wooden, or metallic boxes, except that paper wrappings may be used for block or card matches, and these boxes must be placed in a hermetically sealed metal box made of not less than 30 gauge United States standard. This metal box must be placed in a closely fitting box made of sound lumber. When a nailed box is used the ends must not be less than 1 inch thick, and the top, bottom, and sides not less than ½ inch thick. If box is of lock-corner construction the ends, top, bottom, and sides must not be less than ½ inch thick.

47. The gross weight of any package containing "strike anywhere" matches must not exceed 40 pounds, and the outside package must be plainly marked "STRIKE ANYWHERE MATCHES."

"Strike anywhere" matches must not be packed in the same outside package with any other article.

Group 5.—Oxidizing Materials—Yellow Label.

48. Oxidizing materials and acids must not be packed together. The maximum quantity of any oxidizing material not otherwise prescribed (see par. 34, column 4) placed in one outside package must not exceed 25 pounds.

49. Oxidizing materials must be placed in strong and tight metal packages packed in strong outside wooden boxes or barrels, or in strong and tight metal-lined wooden boxes.

50. It is important to prevent contact of these materials with combustible substances, such as sawdust, shavings, or sweepings, that may be present in express cars.

Group 6.—Acids and Corrosive Liquids—White Label.

51. The maximum quantity of any corrosive liquid not otherwise prescribed (see par. 34, column 4) placed in one outside package must not exceed 1 quart.

52. Acids or corrosive liquids must not be packed in the same compartment of an outside package that contains one or more substances with which the acid might, on rupture of inside packages, combine chemically and cause a dangerous evolution of heat, gas, or corrosive materials.

53. Acid, or strongly corrosive liquids, must be placed in securely closed glass, earthenware, lead, India rubber, or ceresine vessels of not exceeding 1 quart capacity, and these vessels must be placed in a strong wooden box and surrounded and covered by incombustible porous material that will not be attacked chemically by the liquids, and in quantity sufficient to absorb and hold all of the liquid in any such vessel.

54. Electrolyte or other acid liquids which contain not more than 30 per cent of a mineral acid may be placed in glass or earthenware vessels of not to exceed 5 gallons capacity, in strong wooden boxes cushioned with absorbent packing material in quantity sufficient to absorb and hold all of the liquid.

55. The boxes must be made of sound lumber. When a nailed box is used the ends must be not less than 1 inch and sides, top, and bottom not less than ½ inch thick. If the box is of lock-corner construction the ends, sides, top, and bottom must be not less than ½ inch thick.

Group 7.—Compressed Gases—Red or Light Green (Gas) Label.

57. (*a*) Gases that may combine chemically must not be shipped in one cylinder. Cylinders purchased hereafter for the shipment of compressed gases must be made in accordance with specifications approved by the Interstate Commerce Commission. (See "Shipping container specification No. 3," page 79.)

(*b*) By water jacket or other suitable tests each cylinder used for shipping liquefied gases must be subjected once in five years to a uniform interior pressure not less than one and one-fourth times the interior pressure that would result from heating the cylinder uniformly in its maximum charged condition to a temperature of 130° F. Each cylinder used for shipping under pressure not exceeding 1,000 pounds per square inch nonliquefied gases or gases in solution must be subjected at least once in five years to a uniform interior pressure not less than twice the charging pressure for such cylinder, corresponding to a temperature of 70° F.; when the charging pressure exceeds 1,000 pounds per square inch the test pressure must not be less than one and one-half times the charging pressure. A cylinder must be condemned when it leaks, when the permanent expansion is due to local weakness, or when it is uniform and exceeds 5 per cent of the total expansion. When the charging pressure is less than 300 pounds per square inch it will not be necessary to measure the permanent expansion in quinquennial pressure tests, provided the cylinder in question has previously passed this test.

(*c*) The weight of gas charged into any cylinder must not at a temperature of 130° F. cause an interior pressure in excess of three-fourths of the elastic limit of the weakest part of the cylinder.

(*d*) After December 31, 1914, all cylinders must be plainly stamped with the date of last test—for example, 4–09, for April, 1909—or otherwise durably marked to show compliance with this rule; and by December 31, 1911, not less than one-fourth of the cylinders in use for shipping purposes must be thus tested and marked.

(*e*) Cylinders containing acetylene gas must be made of tough steel and must be completely filled with a porous material tested by the Bureau of Explosives and approved by the Interstate Commerce Commission, and this material must be charged with acetone or its equivalent not to exceed 40 per cent of the interior volume capacity of the cylinder. The pressure in cylinders containing acetylene gas must not exceed 250 pounds per square inch at a temperature of 70° F.

58. After December 31, 1914, each cylinder containing liquefied gases, or gases in solution, or other gases under more than 300 pounds per square inch pressure, must be equipped with a safety device approved by the Interstate Commerce Commission that will prevent explosion of the normally charged cylinder when it is placed in a fire.

59. When cylinders containing inflammable gases are not boxed for shipment the safety device and discharging valve must be made safe from injury during transit by a design and construction of the cylinder or they must be protected by strong metal caps that can not be detached by rolling the cylinder.

LABELS.

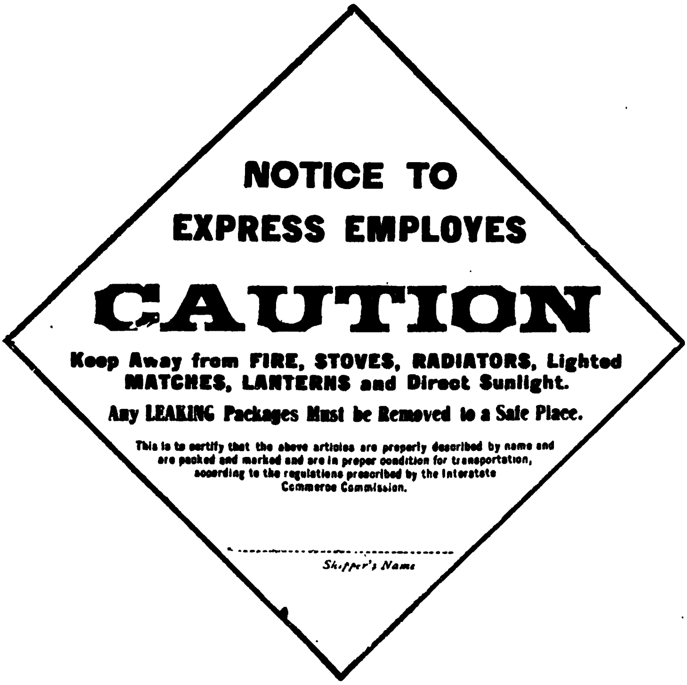
60. All packages containing samples of explosives for laboratory examination or dangerous articles other than explosives, for which labels are prescribed herein (see pars. 16 and 28 to 34, inclusive) must be conspicuously labeled by the shipper. Labels should be applied when practicable to that part of the package bearing the consignee's name and address. Shippers must furnish and attach the labels prescribed for their shipments.

Labels must conform to standards as to printing, color, size, and shape, and must be free from advertising or other matter. The prescribed labels must not be printed in with nor form part of any other shipping label or printed matter. Samples will be furnished by the chief inspector of the Bureau of Explosives on request.

61. Labels for dangerous articles other than explosives must be of diamond shape, with each diagonal (not sides) 5¾ inches long. The colors must be *red* for inflammable liquids and compressed inflammable gases, *yellow* for inflammable solids and oxidizing materials, *light green* for compressed noninflammable gases, and *white* for corrosive liquids.

The wording must be in black letters and, except as provided in paragraph 62, as follows:

Red label for inflammable liquids (reduced size).



NOTICE TO
EXPRESS EMPLOYES

CAUTION

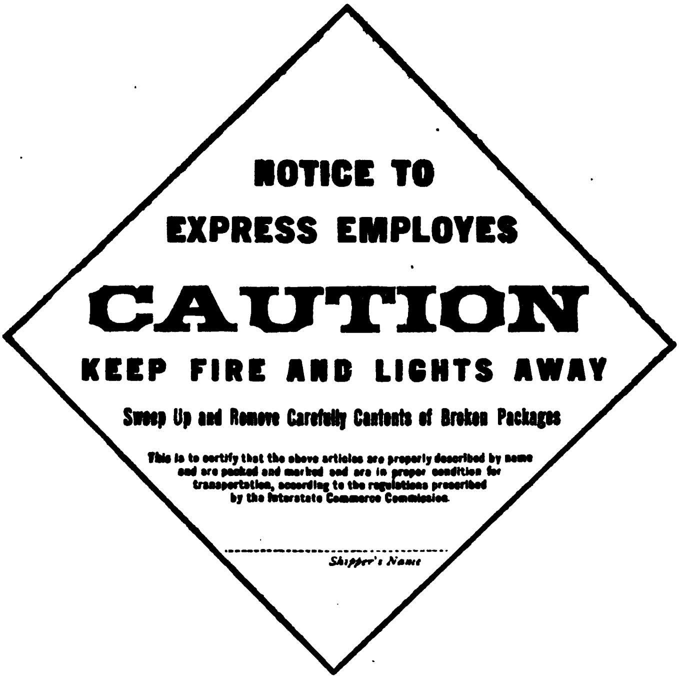
Keep Away from FIRE, STOVES, RADIATORS, Lighted MATCHES, LANTERNS and Direct Sunlight.

Any LEAKING Packages Must be Removed to a Safe Place.

This is to certify that the above articles are properly described by name and are packed and marked and are in proper condition for transportation, according to the regulations prescribed by the Interstate Commerce Commission.

....
Shipper's Name

Yellow label for inflammables (reduced size).



NOTICE TO

EXPRESS EMPLOYES

CAUTION

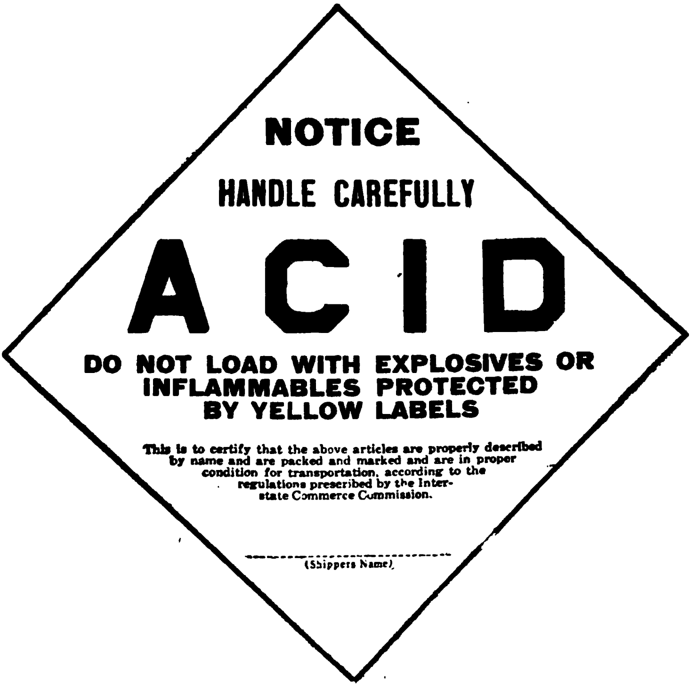
KEEP FIRE AND LIGHTS AWAY

Sweep Up and Remove Carefully Contents of Broken Packages

This is to certify that the above articles are properly described by name
and are packed and marked and are in proper condition for
transportation, according to the regulations prescribed
by the Interstate Commerce Commission.

....
Shipper's Name

White label for acids and corrosive liquids (reduced size).



NOTICE

HANDLE CAREFULLY

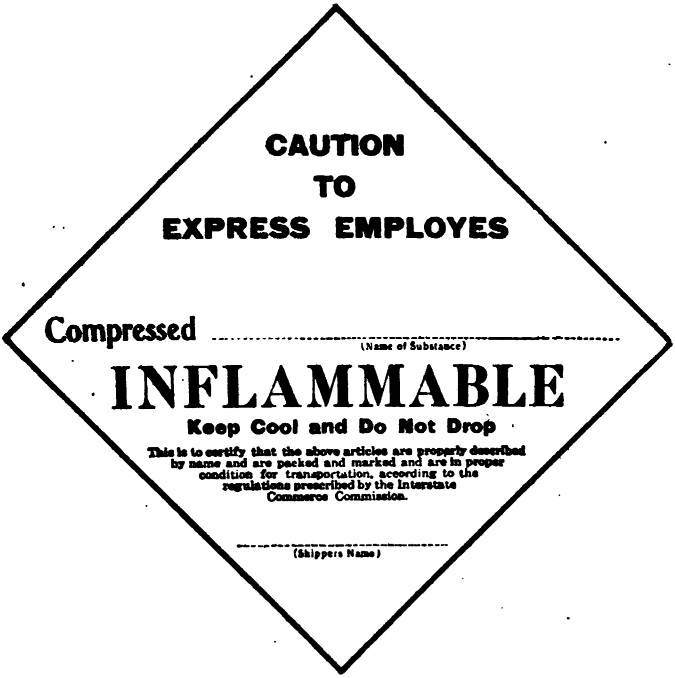
ACID

DO NOT LOAD WITH EXPLOSIVES OR
INFLAMMABLES PROTECTED
BY YELLOW LABELS

This is to certify that the above articles are properly described
by name and are packed and marked and are in proper
condition for transportation, according to the
regulations prescribed by the Inter-
state Commerce Commission.

....
(Shippers Name)

Red label for inflammable gases (reduced size).



CAUTION
TO
EXPRESS EMPLOYES

Compressed ....
(Name of Substance)

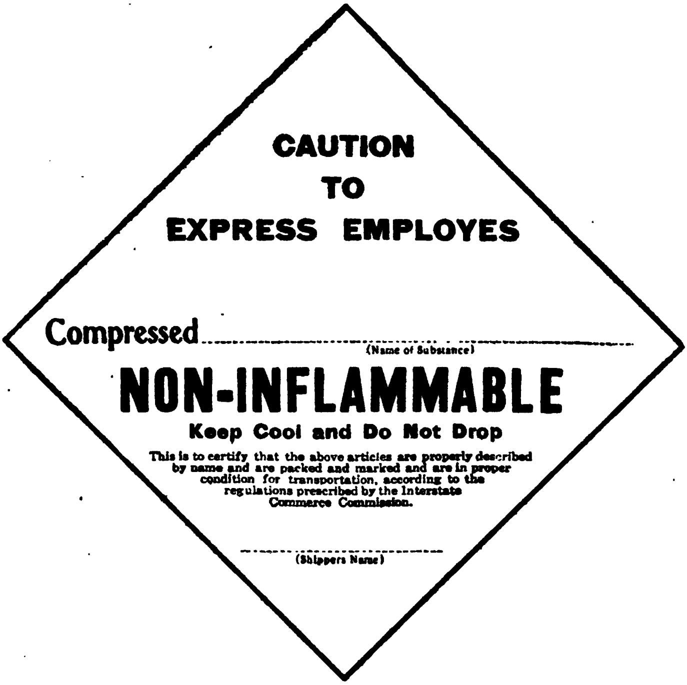
INFLAMMABLE

Keep Cool and Do Not Drop

This is to certify that the above articles are properly described by name and are packed and marked and are in proper condition for transportation, according to the regulations prescribed by the Interstate Commerce Commission.

....
(Shippers Name)

Light green label for non-inflammable gases (reduced size).



CAUTION
TO
EXPRESS EMPLOYES

Compressed ....
(Name of Substance)

NON-INFLAMMABLE

Keep Cool and Do Not Drop

This is to certify that the above articles are properly described by name and are packed and marked and are in proper condition for transportation, according to the regulations prescribed by the Interstate Commerce Commission.

....
(Shippers Name)

62. The labels prescribed herein are identical in color, size, and form, and in the instructions printed thereon with the labels prescribed for dangerous articles other than explosives when transported by freight. Shippers who do not desire to provide themselves with the labels prescribed herein may use the labels prescribed by the regulations for the transportation of dangerous articles other than explosives by freight, effective March 31, 1912, provided the shipper stamps or writes near each such prescribed label on each package containing any article covered by these regulations the following certificate:

This is to certify that the above articles are properly described, packed, and marked and are in proper condition for transportation according to the regulations prescribed by the Interstate Commerce Commission.

....
(Shipper's name.)

or the shipper may apply to each such package a white label measuring not less than 1½ by 3 inches and bearing the above certificate.

RECEIPTS.

63. A receipt upon the form prescribed by the originating express carrier must be issued to the shipper for each shipment accepted for transportation. Before a receipt is issued the shipper must apply the label prescribed herein to each package containing any article covered by these regulations.

RULES FOR EXPRESS CARRIERS.

64. Express carriers must comply with requests from shippers of dangerous articles in their territory for a copy of these regulations.

65. In handling packages containing explosives or other dangerous articles care must be taken to prevent them from falling or from being broken. They must not be thrown, dropped, nor rolled.

66. Packages containing explosives or other dangerous articles when transported in a passenger train must be loaded in the car occupied by an express employe, and in a place that will permit of their ready removal in case of fire. They must not be loaded in cars nor stored in stations near steam pipes or other sources of heat. No placards are required on such cars.

67. When an express or baggage car containing any package requiring a label prescribed by these regulations is not occupied by an express employe and is handled in a freight train the proper placards must be attached thereto as required by the regulations for the transportation of explosives and the regulations for the transportation of dangerous articles other than explosives by freight.

68. The originating express carrier must, when a shipment is offered to it that is known to contain dangerous articles as defined

by these regulations, see that the packages are marked and labeled and that the certificate is furnished as prescribed herein.

69. Packages of dangerous articles offered for shipment and not properly packed, marked, labeled, described, and certified must not be accepted by the express carrier until these regulations are complied with.

70. Shipments of dangerous articles offered by connecting express or other transportation lines must comply with these regulations.

71. An astray shipment of dangerous articles, or a shipment made in violation of these regulations without the knowledge of the carrier, must be forwarded promptly to destination, if known, provided a careful inspection shows the package to be in proper condition for safe transportation. If the package is unlabeled and the exact nature of the contents is unknown the red label must be applied.

72. Packages containing dangerous articles as defined by these regulations, which are refused by the consignees or which can not be delivered within 48 hours after arrival at destination, must be disposed of by return to the shipper, or by storage in a safe place, or by sale or destruction when it is evident that storage on the carrier's property will be a source of real danger.

73. Violations of these regulations and accidents or fires in connection with the transportation or storage on express or railway property of dangerous articles must be reported by the express carrier to the chief inspector of the Bureau of Explosives, 30 Vesey street, New York.

SHIPPING CONTAINER SPECIFICATIONS.

SHIPPING CONTAINER SPECIFICATIONS.

SHIPPING CONTAINER SPECIFICATION No. 1. (See par. 1822(*a*), p. 41, and par. 36, p. 65.)

Glass Carboys for Corrosive and Inflammable Liquids.

Revised January 1, 1912. Effective March 31, 1912.

1. All carboys used for the shipment of acids or inflammable liquids named under paragraph 1807, page 32, and paragraph 34, page 64, must conform to the following specifications (see par. 1852): A carboy with a capacity of 12 gallons shall contain a minimum of 16 pounds of glass. A carboy with a capacity of 13 gallons shall contain a minimum of 16¾ pounds of glass.

2. These carboys shall have been properly annealed by placing in ovens or lehrs immediately after finishing, and shall be subjected to an annealing temperature of not less than 1,000° to 1,100° F. and gradually cooled to the necessary finishing temperature required by local conditions. The annealing process shall be maintained for about 30 hours for ovens or about 9 hours for lehrs.

3. The regular test of tapping with an iron rod shall then be applied carefully to detect any weakness or defect due to variations in thickness of glass, or to other causes, and all such defective carboys must be rejected.

4. An identifying mark shall be blown in the bottom or neck of each carboy manufactured hereafter to enable the manufacturer's name and year of manufacture to be determined.

5. The carboy must be completely inclosed in a strong wooden box or cylindrical iron case and so cushioned by proper packing material (see paragraphs 1855, 1856, 1857, and 1858) that the glass will not come in contact with the wooden or iron covering. If the neck of the carboy projects, it must be protected by a wooden or metal hood securely attached to the box. When the hood is attached with nails or screws, they must not come in contact with the glass of the carboy.

SHIPPING CONTAINER SPECIFICATION No. 2. (See par. 1822(*a*), p. 41, and par. 36. p. 65.)

Metal Cans and Boxes for Inflammable Liquids.

Revised January 1, 1912. Effective March 31, 1912.

CANS.

1. Cans as provided in paragraph 1824, page 42, and paragraph 38(*a*), page 65, exceeding 1 gallon and not exceeding 10 gallons capacity must be made of metal not lighter than 30 gauge United States standard.

2. Cans as provided in paragraph 1824, page 42, and paragraph 38(*a*), page 65, not exceeding 1-gallon capacity, may be made of metal lighter than 30 gauge United States standard, but it must be such as will provide proper protection against leakage in transit.

3. Each completed can must be tested by its manufacturer and must not leak air when tested under water with interior air pressure of at least 5 pounds per square inch.

BOXES.

4. Packing boxes for cans of any capacity containing inflammable liquids must be made of sound lumber of not less than the following thicknesses and in accordance with the following specifications.

5. Good sound yellow pine, or any wood equal or superior in strength, is acceptable. All lumber used must be dry and well seasoned, no loose knots in any part, nor sound knots on the nailing edges.

Minimum thicknesses of lumber specified refer to the actual thicknesses in the finished boxes.

BOX FOR SINGLE 5-GALLON CANS.

6. *Ends.*—Grain vertical, of one-piece material not less than ⅝ inch thick for nailed uncleated box.

7. *Paneled ends* may be used with cleats not less than ⅝ by 1¼ inches tenoned; filling not less than ¼ inch thick securely fastened to cleats with clinched nails.

8. *Single-cleated ends.*—Grain vertical, cleats not less than ⅝ by 2½ inches. Ends proper of two pieces not less than ⅝ inch thick, cleats securely fastened with clinched nails.

9. *Sides.*—Not less than ⅜ inch thick, no more than three pieces unless tongued and grooved.

10. Sides must be nailed with not less than six 5-penny coated nails in each nailing surface, and if the box is deeper than 15 inches the number of nails used must be increased so that nailing centers are approximately 2 inches apart.

11. *Tops and bottoms.*—Not less than ⅜ inch thick; no more than two pieces unless tongued and grooved.

Must be nailed to ends with not less than five nails in each nailing surface, and where the receiving portion of the end is with the grain 6-penny coated nails must be used. If the receiving portion is across the grain of the wood 5-penny coated nails are acceptable.

When cleated ends are used at least 40 per cent of the bottoming nails must be driven into cleats.

12. If boxes are made with locked corners the ends must not be less than $\frac{9}{16}$ inch and the sides, tops, and bottoms not less than $\frac{5}{16}$ inch thick.

BOX FOR TWO 5-GALLON CANS.

13. *Ends.*—Grain vertical, of one-piece material not less than ¾ inch thick.

Other styles of ends like single 5-gallon box.

Balance of specifications, including nailing, same as single 5-gallon box except that two nails must be driven through the bottom into the center of the sides.

14. If boxes are made with lock corners the ends must not be less than ⅝ inch and the sides, tops, and bottoms not less than ⅜ inch thick.

BOX FOR SINGLE 10-GALLON CAN.

15. *Ends.*—Must be cleated whether of one or two piece material and not less than ⅝ inch thick. Cleats not less than ⅝ by 2½ inches securely fastened with clinched nails.

16. *Sides.*—Not less than ½ inch thick. No more than four pieces unless tongued and grooved, securely nailed with 6-penny coated nails at approximately 2-inch nail centers.

17. *Bottoms.*—Not less than ½ inch thick. No more than two pieces unless tongued and grooved, securely nailed with 6-penny coated nails at approximately 2-inch nail centers; 50 per cent of nails must be driven into cleats.

18. *Tops.*—Not less than ⅜ inch thick. No more than two pieces unless tongued and grooved, securely nailed with 5-penny coated nails at approximately 2-inch nail centers.

19. If boxes are made with locked corners the ends must not be less than ¾ inch, and the sides, tops, and bottoms not less than ½ inch thick, unless made with ⅝-inch lumber throughout.

BOX FOR SINGLE 1-GALLON OR 2-GALLON CANS.

20. *Ends.*—Not less than ⅝ inch thick.

21. *Sides, tops, and bottoms.*—Not less than $\frac{5}{16}$ inch thick, securely nailed with 4-penny coated nails where the grain of the wood is crossed and 5-penny coated nails where the grain of the wood is paralleled in the receiving portion of the end; nails must be placed at approximately 2-inch nail centers.

22. If boxes are made with locked corners the ends must not be less than ⅜ inch and the sides, tops, and bottoms not less than $\frac{5}{16}$ inch thick.

BOXES FOR ASSORTED SHIPMENTS OF MORE THAN ONE 1-GALLON CAN AND UP TO SIX 1-GALLON CANS OR EQUIVALENT.

23. *Ends.*—One piece, not less than ¾ inch thick. If more than one piece not less than ⅝ inch thick, single cleated.

Cleats not less than ⅜ by 2 inches, securely fastened with clinched nails.

24. *Sides, tops, and bottoms.*—Not less than ⅜ inch thick, nailed at approximately 2-inch nail centers with 5-penny coated nails where the grain of the wood is crossed and 6-penny coated nails where the grain of the wood is paralleled in the receiving portion.

25. If boxes are made with locked corners, the ends must not be less than $\frac{9}{16}$ inch and the sides, tops, and bottoms not less than ⅜ inch thick.

BOX FOR OVER SIX 1-GALLON CANS UP TO TWELVE 1-GALLON CANS, OR EQUIVALENT.

26. *Ends.*—Not less than ¾ inch thick, cleated with ⅝ by 1⅞ inch cleats securely fastened with clinched nails.

27. *Sides, tops, and bottoms.*—Not less than ⅜ inch thick, nailed at approximately 2-inch centers with 6-penny coated nails throughout.

28. If boxes are made with locked corners the ends must not be less than ¾ inch and the sides, tops, and bottoms not less than ½ inch thick.

BOX FOR OVER TWELVE 1-GALLON CANS UP TO TWENTY 1-GALLON CANS.

29. Must be not less than ¾-inch lumber throughout, with single cleated ends, using cleats ¾ by 3 inches that are securely fastened with clinched nails.

30. *Sides, tops, and bottoms.*—Must be nailed at approximately 2-inch nail centers with nails not smaller than 7-penny coated.

31. If boxes are made with locked corners the lumber must be ¾ inch throughout.

NAILING OF COVERS AND BOTTOMS.

32. Gauge of nail shall in no instance be less than 4-penny for the smaller boxes, 5-penny and 6-penny for the medium boxes, and 7-penny for the single 10-gallon shipment and for the larger boxes for assorted shipments. Screws of equal efficiency may be used in place of nails.

Nails must be driven approximately 2-inch nail centers.

33. The boxes must cover the cans and the cans must fit tightly in the boxes. The filling hole must be securely closed and if not entirely covered by the box cover it must be completely protected by it.

SHIPPING CONTAINER SPECIFICATION No. 3. (See par. 1822(*a*), p. 41.)

Seamless Steel Cylinders for the Shipment of Carbonic Acid Gas, Nitrous Oxide Gas, Blaugas, or Nonliquefied Gases whose Charging Pressures exceed 1,000 Pounds and do not exceed 1,800 Pounds per Square Inch.

Revised January 1, 1912. Effective March 31, 1912.

1. Cylinders must be made seamless, of steel of uniform quality, to comply in the present state of the art with the following specifications:

CHEMICAL ANALYSIS.

	Per cent.
Carbon must not exceed	0.55
Phosphorus must not exceed	0.04
Sulphur must not exceed	0.05

PHYSICAL TESTS.

2. *Elastic limit* must not be less than 50,000 pounds nor more than 65,000 pounds per square inch on specimen cut longitudinally from a representative finished cylinder after annealing.

3. *Elongation* must not be less than 10 per cent on an 8-inch length of longitudinal test specimen cut from a representative finished cylinder after annealing.

FLATTENING TEST.

4. For each lot of 200 a representative finished cylinder, after annealing, must withstand, without cracking, flattening between rounded knife edges to a thickness of four times the thickness of the wall of the cylinder. The knife edges must be of wedge shape, converging at an angle of 60°, the point being rounded off with a radius of ½ inch. If any one cylinder from any lot fails to pass this test two others from the same lot must be selected, and these must pass it in order to have the lot accepted. If it should appear that failure in the test is due to improper annealing the manufacturer has the privilege of reannealing the lot and repeating the test.

One out of each 200 cylinders must be subjected to the above chemical, physical, and flattening tests.

ANNEALING.

5. All cylinders after finishing must be uniformly and properly annealed. Dirt and scale must be removed before painting.

HYDROSTATIC TEST.

6. Each finished and annealed cylinder must be subjected to hydrostatic test of not less than 3,000 pounds per square inch in a water jacket or other apparatus of suitable form, to furnish reliable data. The permanent expansion must not exceed 5 per cent of the whole volumetric expansion at this pressure.

THICKNESS OF WALL.

7. The wall of cylinders of 5½-inch outside diameter must be 3/16 inch to ¼ inch thick, and the wall of cylinders of 8½-inch outside

diameter must be not less than ¼ inch thick. This thickness must be verified on each cylinder before necking down.

WEIGHT.

8. The standard 5½-inch by 51-inch cylinder, without cap, must weigh not less than 57 pounds. The standard 8½-inch by 51-inch cylinder, without cap, must weigh not less than 105 pounds.

INSPECTION.

9. The purchaser must provide for inspection at the mills by a competent and disinterested authority who shall be provided with a copy of the order containing all information relating thereto other than price. The inspector shall keep complete records of the various melts from which the steel is taken for the manufacture of the cylinders. Chemical analyses of these melts must be supplied to him by the manufacturer, or, if desired by the purchaser, he must procure samples from which other chemical analyses may be made. The heat number must be stamped on these plates at the steel mill by the inspector, and his stamp on a completely finished cylinder shall be taken as certifying that such cylinder comes within the above physical and chemical specifications.

10. The inspector shall witness the hydrostatic and flattening tests of all cylinders and shall certify to the maker, the purchaser, and the chief inspector of the Bureau of Explosives, No. 30 Vesey Street, New York City, the serial numbers of all cylinders which pass them successfully. He shall stamp his initials on such cylinder immediately beneath the serial number, and the initials of the owner shall be plainly stamped on the cylinder.

11. The hydrostatic and flattening tests must be made by the manufacturer, but under the direction and supervision of the inspector or other representative of the purchaser.

GENERAL CONSTRUCTION.

12. All plates or tubes from which cylinders are made must be free from seams, cracks, laminations, or any defects which may prove injurious to the finished cylinder.

13. The manufacture of the cylinders must be completed with the best appliances and according to the best modern methods. All finished cylinders must show reasonably smooth and uniform surface finish, inspection of inside surface to be made before necking down; the threading of tap and of flange must be even and without checks and the cylinders must show no defects of workmanship or material likely to result in any appreciable weakness of the finished cylinder. A close inspection of each completed cylinder must be made to discover the existence of any defect before acceptance.

14. The purchasers of cylinders may impose additional requirements not inconsistent with these specifications.

SHIPPING CONTAINER SPECIFICATION No. 4. (See par. 1822(*a*), p. 41.)

Lapwelded Steel Cylinders for Anhydrous Ammonia.

Revised January 1, 1912. Effective March 31, 1912.

1. TABLE OF DETAILS AS TO DIMENSIONS.

Outside diameter of cylinder.	Over-all length of cylinder.		Nominal thickness of cylinder wall.	Test pressure per square inch.	Head.			Mouth.			Weight of cylinder.	
					Depth.	Low limit.	High limit.	Diameter.	Low limit.	High limit.	Low limit.	High limit.
Inches.	*Ft.*	*in.*	*Inch.*	*Pounds.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Pounds.*	*Pounds.*
10	3	10	.19	1,000	3¾	$3\frac{9}{16}$	$3\frac{15}{16}$	7½	7⅜	7⅝	87	112
10	4	0	.19	1,000	3¾	$3\frac{9}{16}$	$3\frac{15}{16}$	7½	7⅜	7⅝	90	115
10	7	0	.19	1,000	3¾	$3\frac{9}{16}$	$3\frac{15}{16}$	7½	7⅜	7⅝	150	175
10	3	10	.27	1,500	3¾	$3\frac{9}{16}$	$3\frac{15}{16}$	7½	7⅜	7⅝	113	141
10	4	0	.27	1,500	3¾	$3\frac{9}{16}$	$3\frac{15}{16}$	7½	7⅜	7⅝	117	145
10	7	0	.27	1,500	3¾	$3\frac{9}{16}$	$3\frac{15}{16}$	7½	7⅜	7⅝	203	237
12	7	0	.21	1,000	3¾	$3\frac{9}{16}$	$3\frac{15}{16}$	9	9	9¼	220	250

2. Cylinders must be manufactured from lapwelded pipe made of soft steel of the best welding quality, free from blisters, cracks, or other injurious defects.

INSPECTION AND TESTING OF MATERIAL.

3. The pipe intended for these cylinders must be manufactured by the best appliances and according to the best modern practice, each length to be inspected separately for defects inside and outside and then subjected to the following tests:

(*a*) To each crop end cut from the pipe from which the cylinders are to be made a flattening test must be applied with the weld 45° away from the side which is subject to the greatest bending stress, with knife edges of wedge shape converging at an angle of 60°, the point being rounded off with a radius of one-half inch. In this test the crushing of the walls must be to within four times the thickness of the metal and a crop end must withstand the test without cracking.

(*b*) An internal hydrostatic test of 600 pounds per square inch must be applied to each length of pipe under which it must not show signs of leaking at the weld or elsewhere.

4. Each finished cylinder must be tested by internal hydrostatic pressure as specified in above table, paragraph 1, the test to be conducted as follows:

(*a*) After filling cylinder with water the test pressure specified must be applied for the purpose of detecting leaks and rounding up the cylinder.

(*b*) The cylinder, if tight, must be placed in a water jacket or other approved apparatus for measuring the expansion and the test pressure again applied. The permanent expansion under this test must not exceed 10 per cent of the whole volumetric expansion at the pressure specified.

GENERAL CONSTRUCTION AND INSPECTION.

5. The manufacture of the cylinders must be completed with the best appliances and according to the best modern methods. All finished cylinders must show a reasonably smooth surface, and must have passed the above inspection and tests without showing any defect in workmanship or material likely to result in any appreciable weakness in the finished cylinder. Each completed cylinder must be inspected for such defects at the mill by the purchaser or his representatives before acceptance.

SHIPPING CONTAINER SPECIFICATION No. 5. (See par. 1822(*a*), p. 41, and par. 38, p. 65.)

Iron or Steel Barrels or Drums for Inflammable Liquids (See par. 1824, p. 42, and par. 38, p. 65) Mixed (Nitrating) Acids (See par. 1858 a).

Revised January 1, 1912. Effective March 31, 1912.

1. The provisions of "Shipping container specification No. 5" apply to all containers specified therein that are purchased after December 31, 1911, and used for the shipment of dangerous articles other than explosives. (See par. 1822, p. 41, and par. 38, p. 65.) Each such container purchased subsequently to December 31, 1911, shall have plainly stamped thereon the date of manufacture thereof.

2. An iron or steel barrel or drum with a capacity of from 50 to 55 gallons must have a minimum weight in the black, exclusive of the weight of rolling hoops, of 70 pounds, and a minimum thickness of metal in any part of the completed barrel must not be less than that of full No. 16 gauge, United States standard. When the capacity of the drum or barrel is less than 30 gallons the minimum thickness of metal must not be less than No. 18 gauge, United States standard.

3. An iron or steel barrel or drum with a capacity of from 100 to 110 gallons must have a minimum weight in the black, exclusive of the rolling hoops, of not less than 130 pounds, and the minimum thickness of metal in any part of the completed barrel or drum must not be less than that of full No. 14 gauge, United States standard.

4. Each barrel or drum must stand without leaking a manufacturer's test under water by interior compressed air at a pressure of not less than 15 pounds per square inch, sustained for not less than 2 minutes, and the *type* of barrel or drum must be capable of standing without any serious permanent deformation and without leaking a hydrostatic test pressure of not less than 40 pounds per square inch, sustained for not less than 5 minutes.

5. When filled with water to 98 per cent of its capacity the *type* of barrel or drum must also be capable of standing without leakage a test drop on its chime from a height of 4 feet upon a solid concrete foundation.

6. Bungs and other openings must be provided with secure closing devices that will not permit leakage through them. Threaded metal plugs must be close fitting. Gaskets must be made of lead, leather, or other suitable material. Wooden plugs must be covered with a suitable coating and must have a driving fit into a tapered hole.

7. The method of manufacturing the barrel or drum and the materials used must be well adapted to producing a uniform product. Leaks in a new barrel or drum must not be stopped by soldering but must be repaired by the method used in constructing the barrel or drum.

SHIPPING CONTAINER SPECIFICATION No. 6.

Boxes for "Strike Anywhere" (Friction) Matches.

Revised January 1, 1912. Effective July 1, 1912.

MAXIMUM SIZE OF BOX.

1. No case may have an internal volume exceeding that of a 20-inch cube, or 8,000 cubic inches.

MAXIMUM WEIGHT OF BOX AND CONTENTS.

2. No case constructed of fiber board, corrugated fiber board, or of the wire-bound type shall have a weight, including its contents, exceeding 75 pounds.

No wood lock-cornered case built in accordance with the accompanying specifications shall have a weight, including its contents, exceeding 85 pounds unless both head connections to the sides, top, and bottom are strapped with iron binding, continuous strips ⅝ inch wide, nailed with not more than 5-inch spacing; and under no condition shall the weight of a single wood case and its contents exceed 100 pounds for packages with matches packed regularly, or 115 pounds for packages packed "topsy-turvy."

MAXIMUM CONTENTS OF CASES.

3. The maximum number of match boxes contained in any one case shall be as follows:

Number of boxes.	Nominal number of matches per box.
½ gross	1,000
1 gross	500
2 gross	400
3 gross	300
5 gross	200
12 gross	100
20 gross	Over 50 Under 100
25 gross	Under 50

WOOD BOXES.

MATERIAL.

4. Wood cases must be made of white pine, spruce, or material of similar strength and of suitable quality for the purpose used, reasonably sound, commercially dry, and free from open or loose knots.

CONSTRUCTION.

5. The four edge corners connecting the sides with the head or ends must be lock-jointed and glued. The ends, sides, top, and bottom, when made with more than one piece, must have tongued and grooved or compression joints glued, with as good shift of butts at the corners as is possible, using commercial lumber. The top and bottom must be nailed in an efficient manner.

6. *Minimum thickness of lumber for boxes.*

SIZES OF HEADS, SIDES, TOP, OR BOTTOM.

Maximum dimension.	Minimum dimension.	Thickness of head.	Thickness of sides, top, and bottom.
Inches.	*Inches.*	*Inch.*	*Inch.*
Under 12	Under 12	1/2	3/8
12–15	Under 12	1/2	3/8
12–15	12–15	9/16	3/8
15–18	Under 6	1/2	3/8
15–18	6– 9	9/16	3/8
15–18	9–12	9/16	3/8
15–18	12–15	9/16	3/8
15–18	15–18	5/8	7/16
18–21	Under 9	9/16	3/8
18–21	9–12	5/8	3/8
18–21	12–15	5/8	3/8
18–21	15–18	11/16	7/16
18–21	18–21	11/16	7/16
21–24	Under 9	5/8	3/8
21–24	9–12	5/8	3/8
21–24	12–15	11/16	7/16
21–24	15–18	11/16	7/16
21–24	18–21	11/16	7/16
21–24	21–24	3/4	1/2
24–27	Under 12	11/16	3/8
24–27	12–15	3/4	7/16
24–27	15–18	3/4	7/16
24–27	18–21	3/4	7/16
24–27	21–24	13/16	1/2
24–27	24–27	13/16	1/2
27–30	Under 12	13/16	3/8
27–30	12–15	13/16	7/16
27–30	15–18	13/16	7/16
27–30	18–21	13/16	7/16
27–30	21–24	13/16	7/16
27–30	24–27	13/16	1/2
27–30	27–30	13/16	1/2
30–33	Under 15	13/16	7/16
30–33	15–18	13/16	7/16
30–33	18–21	13/16	1/2
30–33	21–24	13/16	1/2
30–33	24–27	13/16	1/2
30–33	27–30	13/16	9/16
30–33	30–33	13/16	9/16

7. Cases made of tough spruce showing a resistance to bending and tensile strength 15 per cent or more in excess of that of white pine

commercial case lumber may have the sides, top, and bottom reduced in thickness 1/16 inch and the ends 1/8 inch from the above specified thicknesses, but in no case must any side, top, or bottom be made less than 3/8 inch in thickness or any end less than 1/2 inch in thickness.

WIRE-BOUND BOXES.

MATERIAL.

8. Reasonably sound well-seasoned wood, veneered or sawn, absolutely free from open or loose knots must be used, the construction being such that the edges and connection will produce a case as near air-tight as the general wire-bound type of construction will permit.

Veneered wood when used must be practically straight and true to surface with each side, top, bottom, or end of case made of one piece of veneer. If any side, top, bottom, or end is made of more than one piece of veneer or of sawed stock the joints or butts of the various pieces producing one side, top, bottom, or end shall be tongued and grooved and efficiently glued. No material shall be used that has a minimum thickness of less than 1/4 inch for cases which with contents weigh not more than 75 pounds.

CONSTRUCTION.

9. There must be four cleats at each end of each case not less than 15/16 by 11/16 inch. The binding wire at each end must be firmly stapled to each board and each cleat by staples having legs not less than 1 1/8 inches long extending over the wire through each board and into the cleats. The other wire or wires must be firmly stapled to each board by staples extended over the wire and through each board and firmly clinched on the inside. Binding wires shall be not less than No. 16 gauge for cases less than 50 pounds weight, case and contents, and not less than No. 14 gauge for cases over 50 pounds weight, case and contents, the longitudinal spacing of side binding wires being not more than 6 1/2 inches. Staples on binding wires at each end shall be not less than No. 16 gauge and on other wires not less than No. 18 gauge for No. 16 binding wires, and not less than No. 16 gauge for No. 14 binding wires. All staples shall be placed not more than 2 1/2 inches apart. Each wire shall be continuous with the ends tightly twisted at one side. When any case exceeds 12 inches in width perpendicular batten or battens not less than 1 1/2 inches wide by 11/16 inch thick shall be firmly stapled or nailed, provided nails are not less than 1 1/4 inches in length, to each end and also be fastened by nails driven through the bottom and top into the battens, so that the space between battens or cleats shall not exceed 10 inches. The ends shall be firmly fastened to inside of cleats with staples whose legs are not less than 13/16 inch long or with nails not less than 1 1/4 inches in length.

FOR THREE-PLY OR MORE FIBER-BOARD OR PULP-BOARD CASES.

MATERIAL.

10. Fiber board or pulp board used in making fiber-board or pulp-board match cases must be three-ply or more, all plies firmly glued together, the outer ply waterproofed, and no single ply less than 0.02 inch in thickness.

WEIGHT LIMIT 25 POUNDS, CASE AND CONTENTS.

11. When the combined fiber board or pulp board used in making cases is not less than 0.08 inch in thickness, having a resistance of not less than 200 pounds to the square inch, Mullen test, and the outside dimensions of the case, length, width, and depth added, do not exceed 45 inches, the gross weight of the case and its contents shall not exceed 25 pounds.

WEIGHT LIMIT 40 POUNDS, CASE AND CONTENTS.

12. When the combined fiber board or pulp board used in making cases is not less than 0.1 inch in thickness, having a resistance of not less than 275 pounds to the square inch, Mullen test, and the outside dimensions of the case, length, width, and depth added, do not exceed 55 inches, the gross weight of the case and its contents shall not exceed 40 pounds.

WEIGHT LIMIT 60 POUNDS, CASE AND CONTENTS.

13. When the combined fiber board or pulp board used in making cases is not less than 0.1 inch in thickness, having a resistance of not less than 275 pounds to the square inch, Mullen test, and an inner mantle of fiber board or pulp board is arranged and constructed to closely fit inside the case, this mantle having a thickness of not less than 0.06 inch, and a resistance of not less than 175 pounds to the square inch, Mullen test, and the outside dimensions of the case, length, width, and depth added, do not exceed 60 inches, the gross weight of the case and its contents shall not exceed 60 pounds.

The mantle must be made in one piece of fiber board or pulp board, with side lap not less than 2 inches wide. Four head laps not less than 1½ inches wide with mitered corners shall be fitted to the mantle at each end.

WEIGHT LIMIT 75 POUNDS, CASE AND CONTENTS.

14. When the combined fiber board or pulp board used in making cases is not less than 0.1 inch in thickness, having a resistance of not less than 275 pounds to the square inch, Mullen test, and an inner mantle of fiber board or pulp board is arranged and constructed to closely fit inside the case, this mantle having a thickness of not less than 0.08 inch and a resistance of not less than 200 pounds to the

square inch, Mullen test, and the outside dimensions of the case, length, width, and depth added, do not exceed 65 inches, the gross weight of the case and its contents shall not exceed 75 pounds.

The mantle must be made in one piece of fiber board or pulp board, with side lap not less than 2 inches wide. Four head laps not less than 1½ inches wide with mitered corners shall be fitted to the mantle at each end.

CUTTING AND SCORING.

15. The heads of all solid fiber cases must be formed of four laps of length within ⅜ inch of short dimension of head. When the short dimension of head is greater than one-half of the long dimension one of the short-dimension laps must be cut at center of case and one of the long-dimension laps must be scored in the center to bend over the shortened lap.

FORMING.

16. The side lap must be at least 1½ inches wide, double stitched or glued, and stitched with flat wire not less than ⅛ inch wide and of suitable thickness with stitches spaced not more than 2½ inches apart. Machine used must be capable of driving the wire through the fiber board so that the stitching, when completed, will be perfect.

CLOSING.

17. Heads must be closed with animal glue coated on the entire contact surfaces.

WEIGHT-LIMIT.

18. No fiber-board or pulp-board case may be used as container for the shipping and transportation of matches that has an aggregate weight, case and contents, exceeding 75 pounds, or is of such size that the sum of the three dimensions—length, width, and depth—exceeds 65 inches.

FOR DOUBLE-FACED CORRUGATED STRAWBOARD CASES.

MATERIAL.

19. Double-faced corrugated strawboard used in making double-faced strawboard cases must be made of corrugated strawboard with inner and outer facings of fiber board or pulp board, both facings having proper bending qualities, firmly glued to the corrugated sheet with the outer facings waterproofed.

WEIGHT LIMIT 25 POUNDS, CASE AND CONTENTS.

20. When the outer facing of the double-faced corrugated strawboard is not less than 0.018 inch in thickness having a resistance of not less than 85 pounds to the square inch, Mullen test, and the inner facing is not less than 0.018 inch in thickness, having a resistance of not

less than 85 pounds to the square inch, Mullen test, the combined board having a resistance of not less than 200 pounds to the square inch, Mullen test, and the outside dimensions of the case—length, width, and depth—added do not exceed 45 inches, the gross weight of the case and its contents shall not exceed 25 pounds.

WEIGHT LIMIT 40 POUNDS, CASE AND CONTENTS.

21. When the outer facing of the double-faced corrugated strawboard is not less than 0.018 inch in thickness, having a resistance of not less than 85 pounds to the square inch, Mullen test, and the inner facing is not less than 0.018 inch in thickness, having a resistance of not less than 85 pounds to the square inch, Mullen test, the combined board having a resistance of not less than 200 pounds to the square inch, Mullen test, and an inner mantle of double-faced corrugated strawboard is arranged and constructed to closely fit inside the case, this mantle having a resistance of not less than 175 pounds to the square inch, Mullen test, and the outside dimensions of the case—length, width, and depth—added do not exceed 55 inches, the gross weight of the case and its contents shall not exceed 40 pounds.

The mantle shall be made in one piece of double-faced corrugated strawboard, with side lap not less than 2¼ inches wide. Four head laps, not less than 1¾ inches wide with mitered corners shall be fitted to the mantle at each end.

WEIGHT LIMIT 60 POUNDS, CASE AND CONTENTS.

22. When the outer facing of the double-faced corrugated strawboard is not less than 0.018 inch in thickness, having a resistance of not less than 85 pounds to the square inch, Mullen test, and the inner facing is not less than 0.018 inch in thickness, having a resistance of not less than 85 pounds to the square inch, Mullen test, the combined board having a resistance of not less than 200 pounds to the square inch, Mullen test, and an inner mantle of double-faced corrugated strawboard is arranged and constructed to closely fit inside the case, this mantle having a resistance of not less than 200 pounds to the square inch, Mullen test, and the outside dimensions of the case—length, width, and depth—added do not exceed 60 inches, the gross weight of the case and its contents shall not exceed 60 pounds.

The mantle shall be made in one piece of double-faced corrugated strawboard with side lap not less than 2¼ inches wide. Four head laps not less than 1¾ inches wide with mitered corners shall be fitted to the mantle at each end.

WEIGHT LIMIT 75 POUNDS, CASE AND CONTENTS.

23. When two complete double-faced corrugated strawboard cases, one fitted closely inside the other, and each case made complete of double-faced corrugated strawboard having a resistance of not less than 200 pounds to the square inch, Mullen test, fully complying with these

requirements and specifications, are used, and the outside dimensions of the case—length, width, and depth—added do not exceed 65 inches, the gross weight of the case and its contents shall not exceed 75 pounds.

DETAILS OF CONSTRUCTION.

24. Each double-faced corrugated strawboard case shall be made out of one piece of material. The edge connection of the side to the end must be close fitting and be secured by a single cloth or sealing strip not less than 2 inches in width and having a resistance of not less than 120 pounds to the square inch, Mullen test, extending the entire length of the seam and secured by animal glue to the box. Double cloth sealing strips may be used if the inner strip is made not less than 1½ inches wide and the outer strip not less than 2½ inches wide, each cloth having a resistance of not less than 60 pounds to the square inch, Mullen test, each thickness extending the entire length of the seam, the inner being firmly glued to the case, and the outer being efficiently and firmly glued to the inner cloth and to the case.

The heads of all double-faced corrugated strawboard cases with a weight limit not exceeding 25 pounds, case and contents, must be formed with four flaps, each pair of flaps butting at approximately the center line of the head. Cases with a weight of 40 pounds, case and contents, must have the two inner flaps butt at the center line of the head and the two outer flaps each cover the entire head.

Cases with a weight limit up to 60 pounds, case and contents, must have both inner and outer flaps cover the entire area of the head. The double cases required for cases with a weight limit of 75 pounds, case and contents, may be constructed similarly to the construction specified for a single 25-pound weight limit, case and contents.

CLOSING.

25. Heads must be closed with animal glue coated on the entire contact surfaces.

WEIGHT LIMIT.

26. No double-faced corrugated strawboard case may be used as container for the shipping and transportation of matches that has an aggregate weight, case and contents, exceeding 75 pounds, or is of such size that the sum of its three dimensions—length, width, and depth—exceeds 65 inches.

MISCELLANEOUS TYPES OF CASES.

27. Types of packing cases other than those herein discussed will be approved provided they conform to the following requirements:

OTHER TYPES OF WOOD CASES.

28. Wood nailed cases will be approved provided that they conform to all the requirements before specified for wood lock-cornered cases

with the omission of the lock-corner requirements, and with the following exceptions: The heads, top and bottom, to be made 1/16 inch thicker and the sides 3/16 inch thicker than the scantlings before specified for lock-cornered cases. Wood nailed cases will be approved when they conform to all requirements before specified for wood lock-cornered cases with the omission of the lock-corner construction and provided the cases are constructed with vertical and horizontal cleats on the ends; cleats to be at least three-quarters as thick as the material specified for the ends of the lock-corner cases and not less than 1⅞ inches wide. All wood nailed cases having a weight, case and contents, exceeding 55 pounds must have the connection of the heads to the sides, top and bottom, metal strapped, the metal bands being ⅝ inch wide with nails spaced 5 inches apart. Intermediate nails must be worked connecting the sides, top and bottom to said heads, making the spacing of fastening not more than 2½-inch centers. The nail spacing on cases under 50 pounds shall under no condition exceed 3 inches.

OTHER TYPES OF WIRE OR METAL-BOUND CASES.

29. Cases made with metal or wood end frames that are securely connected to the sides, top, and bottom, will be approved provided the scantlings are equal to or in excess of those required for the wire-bound cases before described and the following requirements are complied with:

Wire or metal encircling bands must be securely fastened to the sides, top, and bottom of the case as before specified for wire-bound cases, and the tensile strength of said wire or straps and strength of staple shall be at least equal to that specified for wire-bound cases.

No fiber board shall be used for the sides, top, bottom or ends of wire-bound cases unless the resistance of said board, Mullen test, is 50 per cent in excess of the combined fiber-board case and its inner mantle before described under the designation of "fiber-board cases."

OTHER TYPES OF FIBER-BOARD CASES.

30. Other fiber-board cases with flanged heads or ends will be approved provided said flanged heads or ends are composed of material having a resistance, Mullen test, 50 per cent in excess of that of the sides, with the inner mantle specified under the heading of "fiber-board cases." All heads or ends that are flanged may have one head or end flanged in or out as may be desired, but the second head or end inserted after the case is filled must have its flange project outward, both flanges being metal sewed to the case sides, top and bottom. The width of the flange shall not be less than 1 inch in the clear excluding the fillet.

Fiber-board cases may be fitted with wood frames for the heads or ends but under these conditions the head frames shall not be less than those specified for wire-bound cases, and the scantlings for fiber-board cases, top and bottom, shall not be less than those specified for fiber-board cases, with the exception that the heads shall have a resistance, Mullen test, 50 per cent in excess of that required for the sides, top and bottom, including the inner mantle, wherever specified.

Fiber-board cases fitted with wood frames on the sides or top and bottom longitudinally or fitted with external battens, will be approved providing the scantlings for fiber board in no case exceed that specified for fiber-board cases; the strength of the mantle whenever specified must be added to that of the sides, top or bottom when the strength of any case described under "fiber-board cases" is considered.

METAL CANS.

31. Metal cans made of not less than No. 30 gauge plate, United States standard, and of liquid capacity not to exceed 5 gallons, will be approved provided the cans are sound and well soldered at all joints and seams, and provided that after matches are packed therein the cans are securely closed by soldering so as to supply an air-tight package.

APPENDIX.

ACT OF MARCH 4, 1909, EFFECTIVE JANUARY 1, 1910.

By an act entitled " An act to codify, revise, and amend the penal laws of the United States," approved March 4, 1909, to take effect and be in force on and after the 1st day of January, 1910, the act entitled " An act to promote the safe transportation in interstate commerce of explosives and other dangerous articles, and to provide penalties for its violation," approved May 30, 1908, is repealed, and the following sections of said act to codify, revise, and amend the penal laws of the United States are substituted therefor:

SEC. 232. It shall be unlawful to transport, carry, or convey, any dynamite, gunpowder, or other explosive, between a place in a foreign country and a place within or subject to the jurisdiction of the United States, or between a place in any State, Territory, or District of the United States, or place noncontiguous to but subject to the jurisdiction thereof, and a place in any other State, Territory, or District of the United States, or place noncontiguous to but subject to the jurisdiction thereof, on any vessel or vehicle of any description operated by a common carrier, which vessel or vehicle is carrying passengers for hire: *Provided*, That it shall be lawful to transport on any such vessel or vehicle small arms ammunition in any quantity, and such fuses, torpedoes, rockets, or other signal devices, as may be essential to promote safety in operation, and properly packed and marked samples of explosives for laboratory examination, not exceeding a net weight of one-half pound each, and not exceeding twenty samples at one time in a single vessel or vehicle; but such samples shall not be carried in that part of a vessel or vehicle which is intended for the transportation of passengers for hire: *Provided further*, That nothing in this section shall be construed to prevent the transportation of military or naval forces with their accompanying munitions of war on passenger equipment vessels or vehicles.

SEC. 233. The Interstate Commerce Commission shall formulate regulations for the safe transportation of explosives, which shall be binding upon all common carriers engaged in interstate or foreign commerce which transport explosives by land. Said Commission, of its own motion, or upon application made by any interested party, may make changes or modifications in such regulations, made desirable by new information or altered conditions. Such regulations shall be in accord with the best known practicable means for securing safety in transit, covering the packing, marking, loading, handling while in transit, and the precautions necessary to determine whether the material when offered is in proper condition to transport. Such regulations, as well as all changes or modifications thereof, shall take effect ninety days after their formulation and publication by said commission and shall be in effect until reversed, set aside, or modified.

SEC. 234. It shall be unlawful to transport, carry, or convey liquid nitroglycerin, fulminate in bulk in dry condition, or other like explosive, between a place in a foreign country and a place within or subject to the jurisdiction of the United States, or between place in one State, Territory, or District of the United States, or a place noncontiguous to but subject to the jurisdiction thereof, and a place in any other State, Territory, or District of the United States, or place noncontiguous to but subject to the jurisdiction thereof, on any vessel or vehicle of any description operated by a common carrier in the transportation of passengers or articles of commerce by land or water.

SEC. 235. Every package containing explosives or other dangerous articles when presented to a common carrier for shipment shall have plainly marked on the outside thereof the contents thereof; and it shall be unlawful for any person to deliver, or cause to be delivered, to any common carrier engaged in interstate or foreign commerce by land or water, for interstate or foreign transportation, or to carry upon any vessel or vehicle engaged in interstate or foreign transportation, any explosive, or other dangerous article, under any false or deceptive marking, description, invoice, shipping order, or other declaration, or without informing the agent of such carrier of the true character thereof, at or before the time such delivery or carriage is made. Whoever shall knowingly violate, or cause to be violated, any provision of this section, or of the three sections last preceding, or any regulation made by the Interstate Commerce Commission in pursuance thereof, shall be fined not more than two thousand dollars, or imprisoned not more than eighteen months, or both.

SEC. 236. When the death or bodily injury of any person is caused by the explosion of any article named in the four sections last preceding, while the same is being placed upon any vessel or vehicle to be transported in violation thereof, or while the same is being so transported, or while the same is being removed from such vessel or vehicle, the person knowingly placing, or aiding or permitting the placing, of such articles upon any such vessel or vehicle, to be so transported, shall be imprisoned not more than ten years.

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